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ENERGY MANAGEMENT FOR NAVY FAMILY HOUSING: A MANUAL FOR VOLUNTARY RESIDENTIAL ENERGY CONSERVATION

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Declining energy supplies and skyrocketing energy costs have made it essential that the Navy emphasize conservation in all sectors of its activities. This report presents a manual designed to provide housing administrators with a relatively efficient, step-by-step approach to designing and conducting a local energy conservation program over an extended time period. Principles included in the manual were based on results of previous research efforts concerned with energy conservation in the Navy.

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FOREWORD

This project was conducted as part of a continuing program of research and development being sponsored by the Naval Facilities Engineering Command. The objective of this program is to provide Navy management with information regarding energy policies and programs that would foster conservation by military housing residents.

This report is the fourth in a series concerning the study of utility conservation. Previous reports described the conservation-related attitudes and practices of Navy family housing residents, the evaluation of a conservation program for master-metered housing sites, and the energy-related attitudes, opinions, and self-reported practices of Navy family housing residents (NPRDC SR 79-23, TR 82-18, and TR 82-20). This report provides a manual for use by local housing administrators in designing residential energy conservation programs.

Appreciation is expressed to the many people who have contributed to this effort.

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INTRODUCTION

Problem

Declining energy supplies and skyrocketing energy costs have made it essential that the Navy emphasize conservation in all sectors of its activities. In the housing domain, substantial reductions in utility consumption have been made through technological and structural modifications. Also, through "energy awareness" weeks, attempts have been made to raise the consciousness of Navy personnel regarding their energy-related practices. These "passive" conservation approaches require little or no active participation by residents. However, research has shown that a large component of energy consumption reductions depends on individual consumer behaviors and practices. Even when technological and structural changes have been made, full realization of potential energy savings depends on user practices. As the structural condition and technological state of housing facilities is improved, the behavioral component of energy conservation becomes a more important source of savings in both magnitude of energy and relative cost per unit of energy saved. The challenge is to develop methods for gaining the active participation of energy users in the conservation process. Recognizing this need, Navy family housing managers are seeking a practical approach at the local housing level to bringing about active resident participation in utility conservation.

Background

An energy conservation research program was initiated at the Navy Personnel Research and Development Center (NAVPERSRANDCEN) in 1977. The program involved the analysis of energy-related attitudes of family housing residents and evaluation of behavioral strategies for inducing voluntary reductions in utility consumption by tenants (Feher & Somer, 1979).

Civilian studies have demonstrated the applicability of behavioral strategies to the reduction of utility consumption (e.g., Becker, 1978; Hayes & Cone, 1981; McClelland & Cook, 1980). However, studies within the military family housing context have shown that, although savings are possible, various situational factors must be considered in design of energy conservation programs (White, Magnusson, & Somer, 1979; Feher & Somer, 1979; Feher & Morrison, 1980; Morrison, Feher, & Simmons, 1980; Somer, Feher, & White, 1980; Feher, Little, & Somer, 1981; Little, McCabe, Mills, Feher, & Somer, 1981). These factors include the historical housing benefits package, the current policy of including utilities in rent, master-metering of housing complexes so that individual consumption rates are not available, and current regulations preventing the use of incentives for conservation achievements.

This report is the fourth in a series being issued under the NAVPERSRANDCEN program. Previous reports described the conservation-related attitudes and practices of Navy family housing residents, the evaluation of a conservation program for master-metered housing sites, and the energy-related attitudes, opinions, and self-reported practices of Navy family housing residents (White et. al., 1979; Feher et al., 1981; Little et al., 1981). Results of these efforts indicated that substantial energy savings are possible, that personal communication is important for obtaining resident involvement, and that changes in consumption tend to endure after cessation of the program.

Purpose

The objective of this project was to develop practical guidelines or principles for the design and conduct of energy conservation programs in Navy family housing sites throughout CONUS.

Approach

The following principles were identified as operative in the design and implementation of past tests of energy conservation programs in Navy family housing: (1) communicate personally, (2) vary program intensity, (3) provide conservation information, (4) set conservation goals, (5) express Navy concern, (6) demonstrate housing support, (7) involve the entire family, (8) develop and maintain proconservation attitudes, (9) provide feedback on usage, and (10) commend conservation efforts. These principles can be applied independently, as required, and are consistent with the practical constraints and limitations of a wide range of Navy family housing situations.

A manual was written with sections corresponding to each of the 10 principles. The manual was designed to provide housing administrators with a relatively efficient, step-by-step approach to designing and conducting a local energy conservation program over an extended time period. For each principle, there is a brief explanation, a description of how it can be applied, and an appendix providing specific information, materials, and examples.

Results

The manual, entitled Energy Management for Navy Housing: A Manual for Voluntary Residential Energy Conservation, is provided in the appendix.

Recommendations

The Navy Facilities Engineering Command should:

1. Implement use of the conservation manual throughout Navy family housing in CONUS.

2. Conduct workshops for energy conservation program leaders to provide them with (a) practical experience in the use of the conservation manual and its principles in designing their local conservation programs, and (b) an opportunity to exchange ideas regarding conservation program design.

3. Develop an automated data processing system that will perform utility consumption calculations and provide consumption feedback consistent with the energy conservation manual.

4. Evaluate the manual's effectiveness under various situational conditions.

REFERENCES

Becker, L. J. Joint effect of feedback and goal setting on performance: A field study of residential energy conservation. Journal of Applied Psychology, 1978, 63, 428-433.

Feher, B., Little, D. F., & Somer, E. P. Energy conservation in Navy family housing: A "master-metered" approach (NPRDC Tech. Rep. 82-18). San Diego: Navy Personnel Research and Development Center, November 1981.

Feher, B., & Morrison, R. "Occupant Response," Chapter 4 in Family housing metering test: Report to the Congress. Office of the Deputy Assistant Secretary of Defense (Installations and Housing). Washington, DC: 1980.

Feher, B., & Somer, E. P. (Eds.). Behavioral strategies for energy conservation field experiment: Volume 1. La Jolla, CA: Science Applications, Inc., November 1979.

Hayes, S. C., & Cone, J. D. Reduction of residential consumption of electricity through simple monthly feedback. Journal of Applied Behavior Analysis, 1981, 14, 81-88.

Little, D. F., McCabe, K. I., Mills, S., Feher, B., & Somer, E. P. Energy-related attitudes of Navy family housing residents (NPRDC Tech. Rep. 82-20). San Diego: Navy Personnel Research and Development Center, December 1981.

McClelland, L., & Cook, S. W. Promoting energy conservation in master-metered apartments through group financial incentives. Journal of Applied Social Psychology. 1980, 10(1), 20-31.

Morrison, R., Feher, B., & Simmons, W. "Other Considerations," Chapter 5 in Family housing metering test: Report to the Congress. Office of the Deputy Assistant Secretary of Defense (Installations and Housing). Washington, DC: 1980.

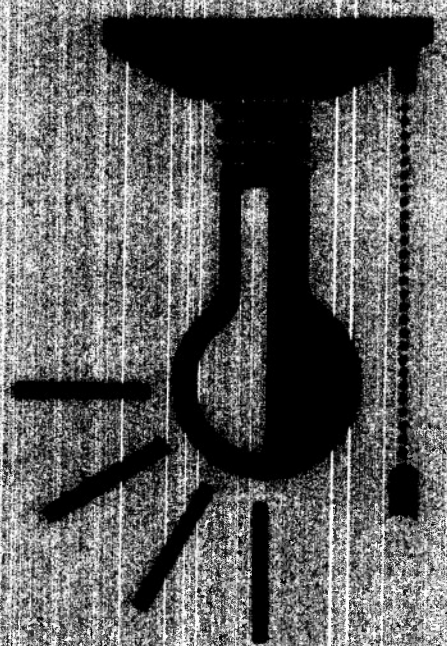
Somer, E. P., Feher, B., & White, M. Promoting residential energy conservation behavior: The effect of feedback and incentives in a group participation setting. Paper delivered at the Western Psychological Association, 1980.

White, M., Magnusson, P., & Somer, E. P. Energy conservation attitudes and behaviors of Navy family housing residents (NPRDC Spec. Rep. 79-23). San Diego: Navy Personnel Research and Development Center, July 1979.

APPENDIX

ENERGY MANAGEMENT FOR NAVY FAMILY HOUSING: A MANUAL FOR VOLUNTARY RESIDENTIAL ENERGY CONSERVATION

ENERGY MANAGEMENT FOR NAVY FAMILY HOUSING



A Manual for Voluntary Residential Energy Conservation

Developed for
Naval Facilities Engineering Command
by

EVALUATION & SUGGESTIONS

Please rate your satisfaction with this manual in terms of the following characteristics by placing a check mark for each on the appropriate scale.

	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied
Readability				
Clarity				
Organization				
Completeness				
Usefulness				
Attractiveness				

If you have any suggestions, criticisms or other comments, please jot them down very briefly and give us your name and phone number (autovon) so we can call you to discuss them.

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CONTENTS

PURPOSE

This Energy Conservation Manual was written for Navy family housing managers. The manual is designed to provide principles, ideas, and resources for use in developing and conducting utility conservation programs at Navy family housing sites.

With declining energy supplies and skyrocketing energy costs, it is essential for the Navy to confront the present energy situation by emphasizing conservation in all sectors of its activities. The results have been encouraging, with substantial decreases in the energy consumption of ships, aircraft, and shore facilities. This has come about through technological and structural modifications in combination with programs emphasizing energy awareness and efficient energy-related practices.

As we are all well aware, the present energy situation threatens both the national security and economic soundness of our country. To effectively confront this problem, further reductions in consumption in all aspects of Navy operations are essential. This manual is directed toward the energy-related practices of Navy family housing residents.

USING THIS MANUAL

This manual is designed to serve as a simple, straight-forward guide to conductingan energyng conservation program in Navy family housing. The Manual presents ten guiding principles. These principles provide guidance in program development and are the basis of the manual's organization. The following is a list of the guiding principles, including a brief description of each.

1. **Communicate Personally** Make the program personal through the use of face-to-face communication. Residents will be more likely to respond to appeals to conserve if requests are received personally.

2. **Vary Program Intensity** Plan program intensity to correspond with seasonal variations. Program intensity should be maximum immediately prior to seasonal changes resulting in greater utility consumption.

3. **Provide Conservation Information** Provide residents with information on how to conserve. Those practices which are optimally energy efficient should be clarified and misconceptions about the importance and ease of conservation corrected.

4. **Set Conservation Goals** Set challenging, but attainable conservation goals. Set overall goals for reduced utility consumption and encourage residents to set personal goals for improving their energy-related practices.

5. **Express Navy Concern** Express the Navy's concern for conservation. Residents should be aware that energy conservation is a Navy-wide concern with efforts being made in all sectors.

6. **Demonstrate Housing Support** Demonstrate housing office support for conservation. Maintain consistency between appeals to residents to conserve and the energy-related practices of housing personnel.

7. **Involve the Entire Family** Since the entire family contributes to energy consumption (or conservation) everyone should be involved in a conservation program. The best way to involve them is through activities – for children as well as adults.

8. **Develop and Maintain Proconservation Attitudes** Provide residents with information supporting proconservation attitudes. Residents should be presented with clear rationales for conserving.

9. **Provide Feedback on Usage** Provide residents with feedback regarding their utility consumption. Residents should have some means of knowing the effectiveness of their conservation efforts.

10. **Commend Conservation Efforts** Commend residents for appropriate conservation practices and reduced utility consumption. Encourage them to continue their new conserving practices and consider adding to them.

Use of these ten guiding principles is simple. Begin by selecting one of the guiding principles for consideration. Next, turn to the section that corresponds with the selected principle. This

section will include information concerning implementation of the principle and often will provide alternative procedures from which to choose. For each guiding principle there is a corresponding appendix containing materials and resources that you may find helpful. These sections include materials which may be duplicated, examples of materials that can be developed, or sources of further information.

For example, you might choose the second principle, "Vary Program Intensity," as a section to examine. You could then turn to the corresponding section of the Guiding Principles where you would find a brief discussion of the rationale for varying program intensity and a description of programs for housing units with and without air conditioning systems. After reading the principle you could turn to Appendix B for examples of annual schedules and monthly checklists of coordinator activities. These principles and the aids in the appendices should provide you with the basis for designing your own energy conservation program.

To maximize the program's effectiveness, the ten guiding principles should be used in conjunction with one another. You'll probably find it best to begin by examining the first principle and then proceeding directly through the list.

If the procedures associated with a guideline do not fit your needs, you may want to develop some procedures of your own. The chart on the following page provides an example of how the initial six weeks of a program might be planned. Although your program may be quite different, this chart can help you visualize how all of the guidelines may be combined in a program.

SAMPLE PROGRAM: OVERVIEW OF INITIAL SIX WEEKS

GUIDING PRINCIPLES	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
1. Communicate Personally	Visit Families — — —	— — — →			Visit Families — — —	— — — →
2. Vary Program Intensity	Initiate High-Intensity Phase					
3. Provide Conservation Information	Provide Residents With Literature (e.g. during visits)	— — — — →	Provide Residents With Literature (e.g. after speaker)		Provide Residents With Literature (e.g. during visits)	— — — — →
4. Set Conservation Goals	Explain and help set goals (e.g. newsletter article)	— — — — —	— — — — →		Discuss progress towards goals (e.g. during visits)	— — — — →
5. Express Navy Concern	Show Navy-wide concern (e.g. Newsletter article)		Show Navy-wide concern (e.g. statement by base CO)			
6. Demonstrate Housing Support	Explain Housing Office Efforts (e.g. during visits)	— — — — →				
7. Involve the Entire Family			Family Activity (e.g. guest speaker, movie, etc.)		Family Activity (e.g. energy detective activity)	— — — — →
8. Develop & Maintain Proconservation Attitudes	Provide Rationale for conserving (e.g. newsletter article)	— — — —	→		Provide Rationale for conserving (e.g. during visits)	— — — — →
9. Provide Feedback on Usage	Read Meters (beginning of week)		Read Meters & Calculate Usage	Inform Residents of Usage (e.g. mock billing)		
10. Commend Conservation Efforts					Thank Residents for Efforts (e.g. during visits)	Awards to top Conservers (e.g. Certificates)

_____ ENERGY CONSERVATION PROGRAM

GUIDING PRINCIPLES	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
1. Communicate Personally						
2. Vary Program Intensity						
3. Provide Conservation Information						
4. Set Conservation Goals						
5. Express Navy Concern						
6. Demonstrate Housing Support						
7. Involve the Entire Family						
8. Develop & Maintain Proconservation Attitudes						
9. Provide Feedback on Usage						
10. Commend Conservation Efforts						

GUIDING PRINCIPLES

Principle 1: Communicate Personally

Personal communication is essential for a voluntary energy conservation program to have substantial impact. Information programs relying only on impersonal materials, such as newsletters and pamphlets, are generally ineffective in producing behavior change. A personal approach can be responsive to family differences in composition, energy-related practices, and attitudes toward conserving. Direct interaction with families heightens their attention to the program and its goals. It may also motivate them to act out some of their good intentions. In addition, specific questions that residents have can be answered directly, breaking down what often become hurdles to action or behavior change.

Applications of Principle 1

There is no one best way to communicate personally. However, various alternative means for personal communication vary in their degree of personal interaction, and thus in impact on behavior change. These alternatives also vary in resource requirements, so each housing office should choose among the alternatives so as to maximize personal communication within the constraints of manpower and resources available.

Highly personal communication involves face-to-face contact between a housing representative (e.g., energy conservation coordinator) and one or more housing residents. The representative could make door-to-door visits to residents, enlisting their cooperation and support and answering any conservation-oriented questions. These visits might occur one or more times during a high consumption season.

Where individually metered housing units exist, a less comprehensive version of the face-to-face approach might concentrate efforts on problem consumers only. Housing office personnel would visit high utility users (based on monthly totals adjusted for family and unit size) and residents seen wasting energy (e.g., porch light on during the day, or air conditioner on with windows and doors open).

An alternative form of personal communication might occur during orientation of new residents. Along with standard orientation, residents could be informed of on-going conservation efforts and could be provided with conservation literature and materials. To further emphasize the importance of conservation, a specially designated housing representative can perform the conservation orientation as a separate step in the orientation procedure. This method of communication probably would be considered weaker in its impact on conservation, since it would occur once in two or three years and would not necessarily coincide with the high energy usage periods.

Personal communication also can be achieved through presentations by housing office personnel to clubs and organizations around the base. These presentations could be timely, and they could provide opportunity to motivate individuals and distribute relevant information in the form of pamphlets. However, such presentations are not likely to reach all the residents no matter how diligently pursued. It is important to emphasize the personal dimension in such presentations by insisting on two-way communication in the form of question and answer sessions, structured small group discussions, and other forms of audience participation (e.g., suggestions, problem solving).

A less intense, but still personal communication is a letter directly to each resident from the commanding officer and/or other appropriate officials calling for active support and providing a rationale for the importance of residential conservation by every family. These requests from the CO could be followed-up by group or individual consumption feedback to each resident on a regular basis through a newsletter or "mock bills" (see Principles 3 and 9).

Each housing office must choose the form of personal communication optimal in its situation, considering its resources and capabilities. Among the feasible alternatives, the approach selected should provide the greatest possible degree of personal communication. Ideally, personal communication through face-to-face exchange will occur several times during each high consumption period. The ideal program requires at least one person to go beyond the typical planning and administrative activities required in any large-scale program. The planning, administrative, and personal contact responsibilities can be combined into a single role, which we call the "energy conservation coordinator." The personal contact aspects of this role may be performed by one designated person or by all housing office personnel during their normal daily contacts with residents.

Personal contact with residents by an "energy conservation coordinator" can be a key to a successful conservation program. Personal contact should lead to friendly relationships with family housing residents. These relationships provide the leverage to be used by the coordinator to encourage residents to attend to conservation information and appeals and follow good practices. Personal contact increases the probability of resident participation by directly confronting individual objections and providing immediate answers to resident's energy-related questions. In addition to enlisting residents' cooperation and commitment, personal contact provides opportunity for commending the conservation efforts of residents.

The coordinator's initial contact with residents is extremely important. During this initial interaction the coordinator can gain residents' interest in the program, determine family characteristics, and enlist family support. Prior to the initial contact, a conservation newsletter or a message from the commanding officer can be distributed to each residence with a statement such as, "You can look forward to a visit by the energy conservation coordinator . . . " This statement can include a brief introduction to the coordinator's background and role in the program. With this introduction residents should feel more comfortable with the coordinator's presence and anticipate appeals to conserve.

Prior to the initial contact, the coordinator should prepare a contact schedule (see Appendix A for an example) and should role play what will be said and responses to questions that residents might ask. A notebook should be prepared with a listing of each residence in order to log residents' names, dates of contacts, and other relevant information (e.g., best times to visit, family composition and interests, and commitment to the program). Any problems regarding the inconvenience caused by the coordinator's visits can be dispelled by assurance of the coordinator's flexible schedule and willingness to return at a more convenient time. Each contact should be focused on a particular topic, e.g., air conditioning, kitchen appliances, or laundry appliances. These topics of the period also would be emphasized at the same time in the newsletter or publicity.

During each contact the coordinator should serve in a supportive role, commending residents for their stated conservation efforts while understanding their difficulties. The coordinator can ask residents to enlist their support of family members not present during the contact and share the information they received. Involvement of the entire family in the commitment process can insure the program's success.

During visits with residents the coordinator can distribute literature and materials relevant to the topic of the period.

FOR MATERIALS CONCERNING PERSONAL COMMUNICATION TURN TO APPENDIX A.

NOTES:

Principle 2: Vary Program Intensity

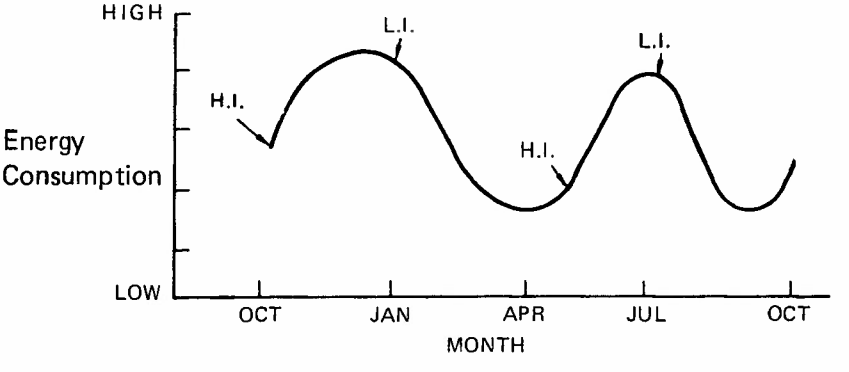
An energy conservation program should be designed on the principle of emphasizing conservation during high consumption periods, and maintaining newly acquired conservation practices through a low intensity program of reminders during the remainder of the year. The program should follow a cyclical pattern, repeatable annually. Climatic conditions, particularly the heat of summer and the cold of winter, are major factors affecting the amount of household energy consumed. According to the United States Department of Energy, "most of our residential energy, 70 percent, is used to heat and cool our homes." Since heating in the winter months is a necessity in virtually all parts of the country, summer temperatures and the accompanying use of air conditioning are probably the major factors distinguishing the differential effects of climatic conditions on energy consumption.

Applications of Principle 2

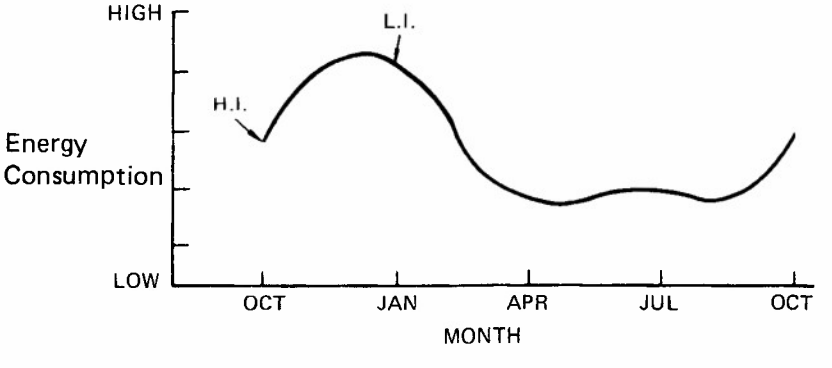
An annual program schedule should vary according to whether or not housing is equipped with air conditioning. Periods in the schedule can be subdivided into two types: (1) A high-intensity period immediately preceding the high consumption months, and (2) a low-intensity period during the remainder of the season. Additional factors may be considered, such as annual school terms, in the timing of the program periods.

ANNUAL CYCLES OF ENERGY CONSUMPTION

Schedule for Units With Air Conditioning



Schedule for Units Without Air Conditioning



The above schedules represent air-conditioned and nonair-conditioned housing units, respectively. Arrows point to the best times for beginning high-intensity (H.I.) and low-intensity (L.I.) conservation programs. These times will actually vary depending on the climatic conditions of the region.

During the high-intensity phase, primary emphasis should be directed toward the high energy users – space heating and cooling, water heating, and other major appliances. Brief periods of high-intensity intervention preceding high-consumption periods are advantageous in that it is during these periods of high use that the greatest reductions in consumption can be made. This greater potential for reduction will result in more opportunities to commend residents for conserving. In addition, this schedule should be most cost effective since the greatest costs are incurred when the greatest gains are possible. Some effects of the high-intensity intervention would naturally carry over to lower consumption periods, but the low intensity program of prompts and reminders is designed to maximize this carry-over.

Alternating between periods of high and low-intensity intervention avoids causing residents to ignore or tune out the conservation appeals, because they feel inundated or turned off by them. During periods of low-intensity intervention reduced consumption can be maintained through monitoring energy consumption levels and prompting appropriate conservation practices already acquired earlier. Contacts by the conservation coordinator, energy newsletters, and energy-related activities can be deemphasized or suspended during the low-intensity periods, thus conserving housing office resources, both monetary and in work load. In addition, the low-intensity phase will permit planning and preparation for the succeeding high-intensity period.

FOR MATERIALS CONCERNING PROGRAM SCHEDULING TURN TO APPENDIX B.

NOTES:

Principle 3: Provide Conservation Information

If residents are to save energy they obviously must be aware of those practices which are most efficient and those which are most wasteful. The majority of residents consider themselves to be well informed about household conservation, but in actual fact many are not. Since awareness must precede changed intentions, habits, and practices, conservation information is essential. However, an effective energy conservation program cannot be based on a massive "junk mail" approach, because the response would be extremely low.

In addition to solid facts about conservation-oriented practices, at least two other topics are crucial to achieving a conservation impact: (1) importance of individual efforts to conserve, and (2) the minimal discomfort, sacrifice, or difficulty involved in an energy conscious life-style. Misconceptions about these two topics often prevent people from becoming conservers; of course, they also serve as rationalizations for anti-conservation attitudes (see principle 8).

Applications of Principle 3

Suggestions concerning energy conserving practices can be incorporated in a conservation newsletter and discussed during the coordinator-resident contacts. Tips for conserving can focus on specific household categories and may need to consider characteristics of the consuming device, such as gas or electric operation. Among the ways of presenting conservation information to residents is the use of various materials, such as pamphlets, posters, and stickers, which are available from government agencies and private industry. Those materials can serve several functions in a comprehensive energy conservation program. Not only do they convey information regarding the importance of energy conservation and provide suggestions for conserving actions, but certain types of materials, such as comic books, posters, and stickers, can provide children with both motivation to conserve and rewards for their efforts. Within the context of coordinator-resident contacts, literature can serve as a foundation for discussion, in addition to leaving residents with a reminder to conserve. Information also can serve to broaden the coordinator's knowledge of the field, thus improving his or her effectiveness and credibility. Although much of the available literature concerns structural modifications, and as such, would be irrelevant to the present program, many materials include behavioral components.

Factors to consider in selecting conservation materials include the age group of the target audience, the reason for distributing the literature, and the availability of materials. Literature appropriate for virtually all age groups is available, from coloring and comic books for the young to relatively comprehensive manuals for highly interested adults. Selected materials should adequately cover the relevant concepts, while avoiding a condescending presentation. Reasons for distributing conservation materials vary from presenting straightforward suggestions as to appropriate conservation practice to stimulating general interest in conservation-related matters. Although a vast supply of literature and other relevant materials is available, there is only so much variability that can be obtained. For this reason, it is advisable to use materials judiciously, timing distribution to coincide with coordinator-resident contacts, special meetings, rewards, and other times when the use of materials is most valuable.

Numerous sources of energy conservation information are available. When requesting materials be sure to plan sufficient time for their delivery. A call to the supplying organization may assist in receiving a prompt response.

FOR MATERIALS CONCERNING CONSERVATION INFORMATION TURN TO APPENDIX C.

Principle 4: Set Conservation Goals

A goal is a measurable outcome toward which actions are directed. An effective conservation program should develop clearly defined utility consumption goals for the entire housing site as well as the families within the site. For example, the Commanding Officer may set a 15% reduction in energy consumption as an overall goal for the base, with housing expected to attain 12% savings. The energy conservation program should lead to individual goal setting by each resident family consistent with the overall base goal.

At master-metered sites "doing one's fair share" would involve examining current practices in relation to conservation tips or information disseminated by the energy conservation coordinator (Principle 3), determining where improvements could be made, and setting goals to adopt improved practices as a family. For example, the family may note that their heating and cooling waste might be reduced by keeping the windows shut, opening doors briefly, and making sure they aren't left open unnecessarily. They may take as one of their goals being more careful about their use of windows and doors. The consumption feedback they receive cannot differentiate their family's contribution to the overall energy reduction obtained, but they can view their contribution as part of the team effort.

At individually metered sites each family can set specific consumption goals for any period they choose and quite easily monitor their degree of success by doing their own meter readings. To achieve their consumption goals the family would probably go through the same process as families in master-metered settings (analysis of their energy consumption practices, adoption of new practices, and monitoring). However, the greater specificity of the consumption data would help them learn whether their new practices made a difference in their consumption and, if so, how much.

Applications of Principle 4

Goals with respect to the overall energy consumption of facilities will require recommendations or decisions from the energy conservation coordinator regarding a reasonable decrease. Care should be taken to make goals challenging while attainable. If goals are too difficult, the residents may become frustrated and give up. Goals that are made too easy may decrease residents' motivation if they are seen as not worth attaining. One must differentiate physical, structural, and technological factors from behavioral factors in energy consumption when setting goals, remembering that the former may set constraints and limits on the potential for savings, but understanding that obtaining full potential from non-behavioral improvements often requires behavioral adaptations. For example, certain types of housing may be more prone to energy loss, and families living in that kind of housing might find attaining an otherwise reasonable goal to be very difficult.

There is justification for the variation of individual goals around the base goal. A health problem, such as asthma, may require conditioning and filtering the air. Older people whose blood circulation is not as efficient may require higher thermostat settings for the same degree of comfort as a younger person. On the other hand, a family where deployment or travel leaves the housing unit vacant for an extended period of time should be able to attain space and water heating or cooling savings, lighting savings, cooking savings, and so forth beyond the overall conservation goal.

Feedback can have important guiding and reinforcing effects for the behaviors it reflects. These effects are maximized with more frequent feedback (e.g. weekly as opposed to monthly). In master-metered situations consumption data is relatively easy to obtain, but it may fail to reflect individual families' efforts enough to be very useful. It might even be perceived as detrimental in

the case where a family makes a great effort, but the overall trend of consumption is level or rising. Two conclusions are possible in such a case: (1) the family's efforts should be redirected to areas where more significant savings are possible, e.g. from lighting to water or space heating, and (2) participation should be broadened by peer pressure on neighbors and friends so that each participant family's savings are not diluted by those of non-participant families.

FOR MATERIALS CONCERNING CONSERVATION GOALS TURN TO APPENDIX D.

NOTES:

Principle 5: Express Navy Concern

The Navy, as well as the rest of the nation, is extremely concerned about energy usage and conservation. Limited and expensive energy resources have resulted in cutbacks throughout the Navy's activities. Flight time and sea tours have been reduced substantially, limiting the nation's defense capabilities.

Throughout the Navy efforts have been made to reduce energy consumption. Structural and hardware modifications, together with changes in energy-related practices, have resulted in significant reductions in consumption. Residents of Navy housing must see residential energy programs as being part of a comprehensive Navy effort. If residents feel they have an unfair conservation burden placed on them, it is unlikely that they will make substantial efforts at reducing consumption.

Applications of Principle 5

Navy-wide conservation goals and activities should be communicated to residents. Information about ongoing programs and successes at other Navy facilities also should be presented. If conservation is seen by residents as an essential team effort, residents will be more likely to cooperate. Both newsletters and personal contacts can serve as methods of communicating this information.

FOR MATERIALS EXPRESSING THE NAVY'S CONCERN TURN TO APPENDIX E.

NOTES:

Principle 6: Demonstrate Housing Support

The residents' view of the housing office's support of energy conservation is usually based on scanty information received at a distance from the decisions, actions, and pressures of administering the housing program. This incomplete information, combined with residents' biases, may result in the perception that any energy conservation program offered by the housing office is an insincere, temporary concern which will "go away" in a short time.

Housing office personnel must demonstrate support of energy conservation to residents. Residents frequently report a lack of consistency between appeals to conserve and housing office policies and practices. The construction and maintenance of housing are often seen as factors which inhibit conservation. This view results in resident attitudes of "why should I care if they don't?" It is essential that residents feel they are working together with housing personnel in efforts to reduce their energy consumption.

Applications of Principle 6

Distorted perceptions can be countered in a number of ways. One would be to regularly share information with residents about the hows and whys of decisions and actions, noting that energy-related factors were considered even when maximum conservation was not achieved due to other considerations.

Support for residents' conservation efforts can be demonstrated through quick response on energy-related maintenance requests, such as repair or replacement of faulty heater thermostats, or weather stripping of doors and windows. Other housing office policies, particularly those related directly to energy usage, can also demonstrate housing support for energy conservation.

Housing office personnel must "practice what they preach" when it comes to energy usage. Excessive use of lights should be avoided and climate control systems should be used efficiently. Present housing office consumption levels can be compared with previous years and positive results reported to residents in newsletters and during contacts. This action would set a good example of energy conservation. It is essential that residents see the conservation program as a concerted effort of the Navy, the housing office, and themselves.

FOR MATERIAL CONCERNING HOUSING SUPPORT TURN TO APPENDIX F.

NOTES:

Principle 7: Involve the Entire Family

In a family housing unit there's usually not just one energy user, but several users of varying age, knowledge, interests, and activities. All these individuals should be targets of an energy conservation program. Developing the conservation interests and concern of everyone is required in order to achieve a substantial reduction in consumption. Conservation-oriented activities are the most effective means of generating this involvement in energy conservation efforts. Joint activities where both parents and children participate together are especially useful in generating involvement because of the mutual support they generate within the family.

Applications of Principle 7

Activities should be planned for both adults and children. Possible adult activities include a speaker/demonstration series conducted by conservation experts, and conservation discussion groups among housing residents. Guest speakers can supplement the coordinator's information and provide a pleasant variation in approach. Discussion groups give residents an opportunity to state their suggestions for program improvement and discuss their own successes and failures. Discussions also can be arranged so that residents can converse with conservation experts.

Possible children's activities include guest speakers, games, contests, and field trips. As with adults, children may benefit from a speaker/demonstration series conducted by experts in energy conservation. As an interesting alternative, games and contests can provide some excitement to the program and directly involve children in the activities. Both an "Energy Detective" program and a poster contest are proposed as possible activities for increasing children's awareness of energy consumption and conservation. One additional possibility is a field trip to an energy-related facility, such as a utility power plant or the local utility's offices. Most children's conservation activities result in the involvement of the entire family and thus lead family members to support each others' conservation actions. For both adults and children, other potential conservation activities abound in existing organizations such as schools, scouts, tenant groups, and within the service member's command. With any activity a number of factors must be considered, including transportation, child care, age restrictions, material costs, and school and sports schedules.

FOR MATERIALS CONCERNING FAMILY INVOLVEMENT TURN TO APPENDIX G.

NOTES:

Principle 8: Develop and Maintain Proconservation Attitudes

Attitudes toward the "energy crisis" and energy conservation tend to be related to energy usage. Most people consider themselves to be energy conservers, but their attitudes, practices, and usage vary considerably. Some anti-conservation attitudes, based on misconceptions, are obstacles to adoption or practice of conservation-oriented behaviors. Among the most important attitudes related to energy usage are beliefs regarding the reality of the energy crisis, the impactof household practices on the overall energy picture, and the consistency among health, comfort, and conservation. Residents with proconservation attitudes in these areas will most likely act in an energy efficient manner.

A rationale for conserving can be based on economic, environmental, or social concerns. An example of the economic rationale would be to tell the residents about the cost of energy to the Navy and its impact on the national security; residents also may be informed of the potential loss of paid utilities in family housing if costs continue to increase. The environmental rationale might consider the pollution problem created in producing electricity. Social concerns might relate to each individual's responsibility to conserve energy and natural resources for the benefit of one's children and grandchildren.

Applications of Principle 8

Developing proconservation attitudes and maintaining them over time is a key function of visits by the energy coordinator. This can also be accomplished to a limited extent through written materials, such as newsletters or pamphlets. It should be realized that this is a long-term process, not usually the result of a one-shot effort. As time goes on more external support for proconservation attitudes will develop, aiding any efforts made in your energy conservation program.

FOR MATERIAL CONCERNING PROCONSERVATION ATTITUDES TURN TOAPPENDIX H.

NOTES:

Principle 9: Provide Feedback on Usage

Residents need to know how successful their efforts are in producing noticeable energy savings. The amount "saved" must be gauged against personal costs (e.g., effort, discomfort, or sacrifice) and rewards (e.g., praise, feeling of accomplishment) to determine whether to continue or expand these practices. People are always interested in comparing their own experience with that of others; quantitative data provides relatively unequivocal comparisons. Similarly, such data provides the basis for setting personal goals and monitoring progress toward achieving them.

The value of consumption information, often called feedback, varies inversely with the length of the consumption period and time lag in receiving feedback. In other words, the greatest value will be obtained from consumption feedback when the shortest possible consumption periods are used (e.g., 1 or 2 weeks) and the delay in delivering results for the period is minimal (2-3 days). Under such conditions residents can still reconstruct what efforts they made during the period, what interruptions or problems were encountered (e.g., weekend visit by relatives), and any other unusual conditions (e.g., away from home for several days).

Providing residents with feedback concerning their individual family consumption, while optimal, is seldom possible in Navy family housing. Most Navy housing is master-metered and precludes examining individual household consumption. An alternative approach is to provide consumption feedback to residents as a group instead of individually. Under these circumstances feedback could consist of either comparing present group consumption with previous consumption, or comparing one group's consumption with that of another.

Where only a single master-meter for housing exists probably the best method of feedback would consist of comparing present group consumption with the average consumption for the same period during the preceding two or three years. This procedure would provide residents as a group with comparison figures from which they can evaluate their present consumption.

Where clusters of housing units are master-metered, resulting in several master-meters, averages for each metered site can be computed and all the averages reported back to the residents. This allows them to compare their average consumption to others' during the same consumption period.

Under individually metered conditions, either of two approaches may be used: (1) comparisons of individual family consumption with the current overall average consumption, or (2) comparisons of present with past consumption. Anytime that present and past consumption are compared it is important to realize that consumption will fluctuate with temperature variation in accordance with space heating and cooling requirements. For this reason it is preferable to use temperature corrections to roughly adjust for climatic differences during the two comparison periods. In evaluating consumption changes from one period to another, changes should be viewed optimistically, providing residents with positive feedback for decreases in consumption, while de-emphasizing small temporary consumption increases, relating them to weather conditions when appropriate.

Applications of Principle 9

Feedback comparing previous and present consumption levels should be included in conservation newsletters or consumption feedback notices. If more than one housing facility is participating in the program the performance of each may be compared as a means of encouraging group feelings and competition. Feedback should be provided as frequently as is feasible (e.g. weekly, bi-weekly, or monthly) and in a manner that is simple and easy to interpret. Feedback may include graphs to assist in representing consumption comparisons.

FOR MATERIALS DESCRIBING DATA HANDLING AND FEEDBACK TURN TO APPENDIX I.

NOTES:

Principle 10: Commend Conservation Efforts

Maintaining newly adopted energy conserving behaviors requires that the individual or family experience some benefits or payoffs for their conservation efforts. This is simply a form of the basic concept of reinforcement.

In some cases the presentation of consumption feedback (Principle 9) will be sufficient for individuals to maintain and improve their level of performance, but in many instances simple feedback will not be enough and other steps must be taken in order to reinforce people for their efforts.

Reinforcement occurs in many forms: social recognition, prizes, thanks, money, or commendations. Government regulations place severe constraints on monetary awards or prizes with significant monetary value. However, by diligent awareness the energy conservation coordinator can give verbal praise and express appreciation where due at relatively little cost. Social recognition can be in the form of "energy conserver of the month", a picture in the paper, or as an interviewee in a feature article on energy-conserving tips found personally successful.

Where individual metering is present, those families who have the greatest success should be commended in one form or another. In master-metered situations where it is impossible to isolate individual unit consumption, the emphasis must be on team effort so when energy usage drops all involved residents of the project should be commended.

Applications of Principle 10

Recognition of superior performers can be provided by placing their names in a newsletter. If consumption feedback notices are sent out monthly to the residents, the names of the top three conserver families for the period could be printed in the message area (see Appendix J). People who are achieving more modest levels of conservation can be commended for their activities during visits by the energy coordinator. Care should be taken to avoid the indiscriminate use of praise or it will lose its value as a reinforcer; praise should only be given where behavior merits it.

FOR MATERIALS CONCERNING COMMENDATION TURN TO APPENDIX J.

NOTES:

APPENDIX A
COMMUNICATE PERSONALLY

- Sample Coordinator-Resident Contact Outline
- Sample Contact Checklist
- Sample Newsletter

SAMPLE COORDINATOR-RESIDENT CONTACT OUTLINE

30 July 1979

Resident Interview Format--Corry Station, 1st Period

I. Introduce self
-Explain project
-Explain own role
-Collect survey
  -If not filled out: "come back in an hour or so"
-Scan survey responses
  -Completeness
  -Vacation (Q13) or visitor plans (Q14)

II. Query resident regarding energy-related structural problems
-Clarify role
  -Information channel to Housing Office; no guarantees of action
  -Make list of problems

III. Administer 1st period treatment
-Handout pamphlet, "40 Questions About Electricity"
-Describe speaker series
  -Ask preferred time & tally (morning, afternoon, evening)
-Handout air conditoning conservation checklist and review each item
  -Nature of each practice
  -Benefit of each practice
-State initial conservation target for Corry Station: "Save 5%"
-Elicit resident commitment
  -"Would you be willing to cooperate with other residents in Corry housing and modify your practices to try to save 5% of your utilities?"
-Review air conditioning conservation practices and formulate specific action plans
  -"The most important thing you can do is control your thermostat setting. What setting do you generally use during the day...? when you're out of the house? at night? Would you be willing to ... (change settings by 3 to 5 degrees, unless already set to 78 during day, 85 when absent, and 82 at night) and try these for several days to see whether your family can adjust or accommodate?
  -Doors
  -Windows
  -Drapes/curtains
  -Dampers
  -Etc.
-State her enthusiasm about the tenants' willingness to cooperate; Give encouragement that these actions are not expected to create any undue hardship and will be quickly adapted to.

IV. Formulate expectations for the future
-Present cookbook as something they might enjoy
-Next visit ("in a couple of weeks") will be to talk about the kitchen as an area for energy conservation
-Energy newsgram will keep participants posted regarding conservation results

SAMPLE CONTACT CHECKLIST

EFFICIENCY IN THE KITCHEN--PART I

1. SET TEMPERATURES
   Check the temperature of your refrigerator and freezer. The following temperature settings are recommended for maximum efficiency:

   Refrigerator:

   Fresh food compartment: 38°-40°F
   Freezer compartment: 5°F

   Freezer: 0°F

2. LET YOUR REFRIGERATOR BREATHE
   Keep the refrigerator at least three inches away from the wall. Clean the dirt and dust off the condenser coils often.

3. KEEP COLD AIR INSIDE
   Open your refrigerator door as seldom as possible and decide what you want before opening the door (watch the youngsters on this one). Check the door gaskets of your refrigerator to see that they seal correctly when closed.

4. REFRIGERATOR CAPACITY
   Keep your refrigerator and freezer properly filled. Air needs to circulate around the food, especially in the refrigerator, but the freezing compartment should be kept full for highest efficiency.

5. DEFROSTING
   Defrost a non-frostfree refrigerator or freezer when frost reaches 1/4 to 1/2 inch thickness. Frost acts as an insulator and prevents efficient cooling of air inside the compartment.

6. DISHWASHERS AND HOT WATER
   Get the most efficient use of hot water by filling your dishwasher to its recommended capacity and using the shortest washing cycle necessary to get the dishes clean. Hand pre-rinsing may help the dishwasher clean better. If you wash and rinse dishes by hand while letting the water run, you may be using more hot water than if you used your dishwasher.

7. DISHWASHERS AND HOT AIR
   Dishwashers can produce a great deal of heat, which can add to an already warm summer home. Try using your dishwasher at night when the extra heat is more tolerable. When you can, let your dishes air dry rather than having them go through the heated drying cycle.

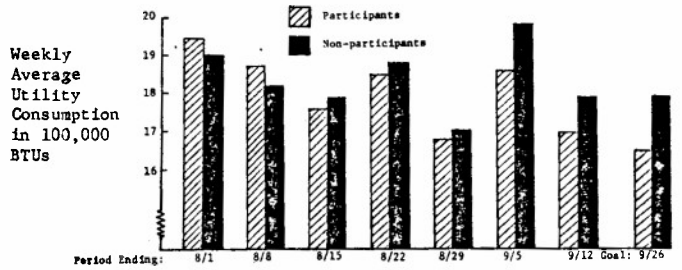
THE CORRY

September 17, 1979
No. 4

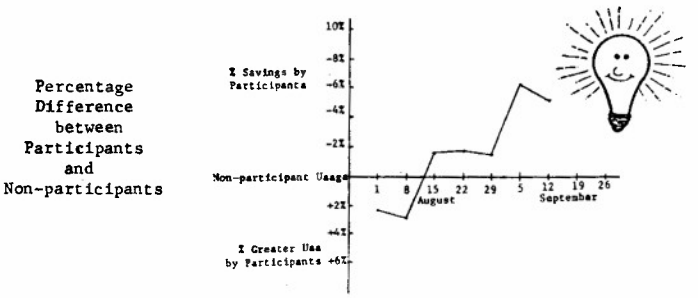
KIL - A - WATT

Energy Conservation Results

There's good news from the third two-week period of the energy conservation study (which preceded the hurricane)! Although the overall average utility consumption was slightly higher, probably due to the weather, the difference between participanta and non-participants was the largest yet achieved (see graph below).



Results show that participanta have turned their initial handicap into better than a 5% advantage, an improvement of 7.5% (8.5% the previous week)! The percentage difference for each week is shown in the figure below.



This notable improvement demonstrates that applying the energy conservation tips can make a difference, and the more of us who apply them the bigger the difference will be. Let's concentrate on helping our children become aware of how their actions can affect our energy consumption and what they can do to "save a fossil by conserving energy".

Our 10% goal is definitely within reach now, so keep up the good work!

Detective Program

By now our young detectives are actively observing their household for energy thieves. If they see any thieves, they should be "turned in" to headquarters (parents) immediately. By the end of the week your utility use may be improved, and everyone should be aware that their behavior can make a difference in household consumption. The watt you save may be your own (to use in the future).

All the energy detectives who completed their log sheets are eligible for 6 self-sticking, fluorescent-colored energy slogans. Just hand in the parent's certification slip to me next time I pass by.

ENERGY EFFICIENCY THROUGHOUT THE HOME

Over the past several weeks the Tips in the Kil-A-Watt have concerned efficient use of large energy consumers around the house (air conditioners, water heaters, refrigerators, freezer, clothes washer and dryer, and dishwasher). That's because those are where the real conservation payoff is found. Today, I have some more tips, but I'm also including a listing of the relative energy consumption of various household appliances. Much of this information will come as good news to you.

Energy Consumption of Household Appliances

Major Consumers	Uses Per Year	KWH/YR
Washer (not including water heating)	364	120
Dryer	364	1199
Freezer (16 cu. ft.; manual def.)	Continuous	1188
(16.5 cu. ft.; auto. def.)	Continuous	1824
Refrigerator/Freezer (17 cu. ft.; auto. def.)	Continuous	2256
Television (Color; solid state)	365 (6 hrs per day)	420
Lighting	Daily	1140-2640
Dishwasher (not including water heating)	364	360
Minor Consumers		
Baby Food Warmer	1092	22
Blender	293	0.9
Can Opener	1000	0.3
Clock	Continuous	22
Blanket	250	150
Corn Popper	50	5
Fry Pan	180	100
Griddle	100	46
Hair Dryer - Hand Held	250	25
Iron	52	60
Knife	90	0.8
Mixer - Hand	150	1
Roaster	12	60
Rotisserie	26	77
Shaver	365	0.5
Slow Cooker	26	35
Toaster	700	39
Toaster-Oven	780	93
Toothbrush	Continuous	10
Warming Tray	26	7

Loosely quoting one utility's conservation advice:

> "Everybody's favorite target seems to be the electric toothbrush. A lot of people pat themselves on the back for hanging it up. But a continuous charge toothbrush costs less than 5 cents per month to operate--no matter how many times you brush each day. Eliminating that is hardly a savings you can sink you teeth into.
>
> The electric shaver is another conservation victim. Yet you can take a five-minute electric shave every day for the next 7 years and 4 months for a dime. It would cost you more to run hot water and shave with a straight edge.
>
> In the kitchen, things like toasters, crockpots, frypans and broiler ovens take a lot of heat. Yet they can actually be big energy savers. You can cook with all of them--sometimes whole meals--for a fraction of the energy you'd use with your range or oven.
>
> A microwave oven seems like a space age luxury. But with small quantities of food it can cut cooking energy costs by 75%, because it's on for such a short time. Electric can openers and popcorn makers are good guys too.
>
> Almost every appliance can be a good guy if used properly. Which means that the biggest energy thief of all may be you. Remember, it's not the energy you need that's bad, it's the energy you waste."

Let me add that what's wasted costs us twice, because we have to replace it for the use it should have gone to in the first place.

TIPS FOR HOMEWIDE ENERGY EFFICIENCY

1. TURN LIGHTS OFF WHEN LEAVING A ROOM--A 100-watt bulb burning half a day requires 1/2 pint of oil at the electric generating plant.

2. USE COLD WATER FOR DISPOSALS--This saves the energy required to heat the water, and aids in getting rid of grease.

3. FIX THE DRIPS--One drop of hot water a second is nearly 200 gallons a month. That's energy down the drain!

4. WATCH LIGHTING WATTAGE--One large bulb is better than several small ones. It takes six 25-watt bulbs to get light equal to a 100-watt bulb and the six 25-watt bulbs use 50 percent more electricity. Correct wattage is important for safety and detailed work but you can save energy by using lower wattage bulbs for decorative and accent lighting.

5. KEEP LIGHT FIXTURES CLEAN--Clean, dust free light fixtures maximize lighting and use energy efficiently.

6. TAKE SHORT SHOWERS--A 5-minute shower saves 1/3 of the water used in a tub bath. Assuming half hot water, just one shower substituted for one bath per day would save about 2,000 gallons of hot water in a year.

7. USE EXHAUST FANS SPARINGLY--Kitchen, bath, and other venilating fans can blow away an entire houseful of warmed or cooled air in just 1 hour.

8. USE A PRESSURE COOKER--It cooks food faster (in about one-third the time), and thus saves energy.

APPENDIX B

VARY PROGRAM INTENSITY

Units <u>With</u> Air Conditioning

- Annual Program Schedule
- Sample Monthly Checklists

Units <u>Without</u> Air Conditioning

- Annual Program Schedule
- Sample Monthly Checklists

ANNUAL PROGRAM SCHEDULE FOR UNITS WITH AIR CONDITIONING

The annual program schedule for units with air conditioning is divided into four phases: (1) high intensity winter phase, (2) low intensity winter phase, (3) high intensity summer phase, and (4) low intensity summer phase. The following list presents a brief description of these four phases, providing a monthly breakdown of each. A more thorough breakdown of monthly activities, presented in a checklist style, is included on the following pages.

High Intensity Winter Phase

OCTOBER – Prepare for high intensity winter phase, developing materials and making initial contacts with potential resource persons.

NOVEMBER – Begin winter energy conservation activities and making resident-coordinator contacts.

DECEMBER -- Continue energy conservation activities and making resident-coordinator contacts.

Low Intensity Winter Phase

JANUARY – Collect data and provide residents with feedback.

FEBRUARY – Collect data and provide residents with feedback.

MARCH – Collect data and provide residents with feedback.

High Intensity Summer Phase

APRIL – Prepare for high intensity summer phase, developing materials, and making initial contacts with potential resource persons.

MAY – Begin summer energy conservation activities and making resident-coordinator contacts.

JUNE – Continue energy conservation activities and making resident-coordinator contacts.

Low Intensity Summer Phase

JULY – Collect data and provide residents with feedback.

AUGUST – Collect data and provide residents with feedback.

SEPTEMBER – Collect data and provide residents with feedback.

SAMPLE MONTHLY CHECKLIST FOR UNITS WITH AIR CONDITIONING

CHECKLIST FOR UNITS WITH AIR CONDITIONING

OCTOBER

High-intensity Winter Phase

Communication Methods

☐ Coordinator-resident contacts - Develop a contact schedule for initiation of the high-intensity winter phase.

☐ Newsletter - Develop a newsletter oriented toward initiation of the high-intensity winter phase.

☐ Newspaper Article (Optional) - Develop a brief newspaper article, discussing initiation of the high-intensity winter phase. Contact newspaper companies.

Activities

☐ Speakers - Organize a speaker series. Contact appropriate agencies, select people, and schedule meeting places.

☐ Energy Detective - Prepare energy detective materials & have copies printed.

☐ Field Trip - Organize a field trip to an energy related facility. Contact appropriate agencies.

Consumption Feedback

☐ Present Consumption-Read utility meters to collect data on present consumption.

☐ Previous Consumption - Check housing office or utility company records for data on past consumption.

☐ Temperature Data - Collect both present and past temperature data from a meteorological center.

☐ Computation - Calculate difference between present and past consumptions.

☐ Write Up - Write newsletter consumption feedback section based on computation results. Project a conservation goal (e.g., 5 or 10% decrease over previous years).

OCTOBER (Continued)

Attitudes and Appeals

/ / Attitudes- Select an attitude domain to emphasize.

/ / Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/ / Tips - Select conservation tips category to emphasize. Gather tips associated with that area.

Information

/ / Literature - Write to sources of energy related information, gathering samples of available materials. Obtain necessary quantities of selected literature.

CHECKLIST FOR UNITS WITH AIR CONDITIONING

NOVEMBER

High-intensity Winter Phase

Communication Methods

/_/ Newsletter - Distribute newsletter to residences. Develop parts of newsletter for December distribution.

/_/ Coordinator-Resident Contacts - Contact residents, conducting interaction according to schedule. Develop a contact schedule for December contact.

Activities

/_/ Speakers - Conduct speaker series. Distribute notices reminding residents of scheduled activity.

/_/ Energy Detective - Complete preparation and copying of energy detective materials.

Consumption Feedback

/_/ Present Consumption - Read utility meters to collect data on present consumption.

/_/ Temperature Data - Collect data on present month's temperatures.

/_/ Computation - Calculate difference between present and past consumptions.

/_/ Write Up - Write newsletter consumption feedback section based on computation results.

Attitudes and Appeals

/_/ Attitudes - Select an attitude domain to emphasize.

/_/ Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/_/ Tips - Select conservation tips category to emphasize. Gather tips associated with that area.

Information

/_/ Literature - Obtain materials from any additional sources.

CHECKLIST FOR UNITS WITH AIR CONDITIONING

DECEMBER

High-intensity Winter Phase

Communication Methods

☐ Newsletter - Distribute newsletter to residences. Develop a newsletter for January's distribution.

☐ Coordinator-Resident Contacts - Contact residents, conducting interaction according to schedule.

Activities

☐ Energy Detective - Distribute and collect relevant energy detective materials.

☐ Field Trip - Conduct field trip to energy related facility.

Consumption Feedback

☐ Present Consumption - Read utility meters to collect data on present consumption.

☐ Temperature Data - Collect data on present month's temperatures.

☐ Computation - Calculate difference between present and past consumptions.

☐ Write Up - Write newsletter consumption feedback section based on computation results.

Attitudes and Appeals

☐ Attitudes - Select an attitude domain to emphasize.

☐ Appeals - Write newsletter directed at domain area selected.

Conservation Tips

☐ Tips - Select conservation tips category to emphasize. Gather tips associated with that area.

CHECKLIST FOR UNITS WITH AIR CONDITIONING

JANUARY

Low-intensity Winter Phase

Communication Methods

/ / Newsletter - Distribute newsletter to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperature.

/ / Computation - Calculate differences between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

FEBRUARY

Low-intensity Winter Phase

Communication Methods

/ / Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

CHECKLIST FOR UNITS WITH AIR CONDITIONING

MARCH

Low-intensity Winter Phase

Communication Methods

/ / Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate differences between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

CHECKLIST FOR UNITS WITH AIR CONDITIONING

APRIL

Preparation for High-intensity Summer Phase

Communication Methods

/ / Coordinator-Resident Contacts - Develop a contact schedule for initiation of the high-intensity summer phase.

/ / Newsletter - Develop a newsletter oriented toward initiation of the high-intensity summer phase.

/ / Newspaper Article (Optional) - Develop a brief newspaper article, discussing initiation of the high-intensity summer phase. Contact newspaper companies.

Activities

/ / Speakers - Organize a speaker series. Contact appropriate agencies, select people, and schedule meeting places.

/ / Poster Contest - Prepare materials for poster contest and have copies printed. Organize exhibition and judging.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

/ / Write Up- Write newsletter consumption feedback section based on computation results.

Attitudes and Appeals

/ / Attitudes - Select an attitude domain to emphasize.

/ / Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/ / Tips - Select conservation tips category to emphasize. Gather tips associated with that area.

CHECKLIST FOR UNITS WITH AIR CONDITIONING

MAY

High-intensity Summer Phase

Communication Methods

/__/ Newsletter - Distribute newsletter to residences. Develop a newsletter for June's distribution.

/__/ Coordinator-Resident Contacts - Contact residents, conducting interaction according to schedule. Develop a contact schedule for June's contact.

Activities

/__/ Speakers - Conduct speaker series. Distribute notices reminding residents of scheduled activity.

/__/ Poster Contest - Announce poster contest. Continue with contest organization.

Consumption Feedback

/__/ Present Consumption - Read utility meters to collect data on present consumption.

/__/ Temperature Data - Collect data on present month's temperatures.

/__/ Computation - Calculate difference between present and past consumptions.

/__/ Write Up - Write newsletter consumption feedback section based on computation results. Project a conservation goal (e.g., 5 or 10% decrease over previous years).

Attitudes and Appeals

/__/ Attitudes - Select an attitude domain to emphasize.

/__/ Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/__/ Tips - Select conservation tips category to emphasize. Cather tips associated with that area.

CHECKLIST FOR UNITS WITH AIR CONDITIONINC

JUNE

High-intensity Summer Phase

Communication Methods

/ / Newsletter - Distribute newsletter to residences. Develop a newsletter for July's distribution.

/ / Coordinator-Resident Contacts - Contact residents, conducting interaction according to schedule.

Activities

/ / Poster Contest - Collect posters and conduct exhibition and judging.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

/ / Write Up - Write newsletter consumption feedback section based on computation results.

Attitudes and Appeals

/ / Attitudes - Select an attitude domain to emphasize.

/ / Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/ / Tips - Select conservation tips category to emphasize. Gather tips associated with that area.

CHECKLIST FOR UNITS WITH AIR CONDITIONING

JULY

Low-intensity Summer Phase

Communication Methods

/ / Newsletter - Distribute newsletter to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate differences between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

AUGUST

Low-intensity Summer Phase

Communication Methods

/ / Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

SEPTEMBER

Low-intensity Summer Phase

Communication Methods

/ / Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

ANNUAL PROGRAM SCHEDULE FOR UNITS WITHOUT AIR CONDITIONING

The annual program schedule for units without air conditioning is divided into two phases: (1) High intensity winter phase, and (2) Low intensity phase. The following list presents a brief description of these two phases, providing a monthly breakdown of each. A more thorough breakdown of monthly activities, presented in a checklist style, is included on the following pages.

High-intensity Winter Phase

OCTOBER – Prepare for high intensity winter phase, developing materials and making initial contacts with potential resource persons.

NOVEMBER – Begin winter energy conservation activities and making resident-coordinator contacts.

DECEMBER – Continue energy consumption activities and making resident-coordinator contacts.

Low-Intensity Phase

JANUARY – Collect data and provide residents with feedback.

FEBRUARY – Collect data and provide residents with feedback.

MARCH – Collect data and provide residents with feedback.

APRIL – Collect data and provide residents with feedback.

MAY – Collect data and provide residents with feedback. Develop materials for extended feedback.

JUNE – Collect data and provide residents with extended feedback.

JULY – Collect data and provide residents with feedback.

AUGUST – Collect data and provide residents with feedback.

SEPTEMBER – Collect data and provide residents with feedback.

SAMPLE MONTHLY CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

OCTOBER

High-intensity Winter Phase

Communication Methods

/ / Coordinator-Resident Contacts - Develop a contact schedule for initiation of the high-intensity winter phase.

/ / Newsletter - Develop a newsletter oriented toward initiation of the high-intensity winter phase.

/ / Newspaper Article (Optional) - Develop a brief newspaper article, discussing initiation of the high-intensity winter phase. Contact newspaper companies.

Activities

/ / Speakers - Organize a speaker series. Contact appropriate agencies, select people, and schedule meeting places.

/ / Energy Detective - Prepare energy detective materials and have copies printed.

/ / Field Trip - Organize a field trip to an energy related facility. Contact appropriate agencies.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Previous Consumption - Check housing office or utility company records for data on past consumption.

/ / Temperature Data - Collect both present and past temperature data from a meteorological center.

/ / Computation - Calculate difference between present and past consumptions.

OCTOBER (Continued)

/__/ Write Up - Write newsletter consumption feedback section based on computation results. Project a conservation goal (e.g., 5 or 10% decrease over previous years).

Attitudes and Appeals

/__/ Attitudes - Select an attitude domain to emphasize.

/__/ Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/__/ Select conservation tips category to emphasize. Gather tips associated with that area.

Information

/__/ Literature - Write to sources of energy related information, gathering samples of available materials. Obtain necessary quantities of selected literature.

CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

NOVEMBER

High-intensity Winter Phase

Communication Methods

/ / Newsletter - Distribute newsletter to residences. Develop parts of newsletter for December's distribution.

/ / Coordinator-Resident Contacts - Contact residents, conducting interaction according to schedule. Develop a contact schedule for December's contact.

Activities

/ / Speakers - Conduct speaker series. Distribute notices reminding residents of scheduled activity.

/ / Energy Detective - Complete preparation and copying of energy detective materials.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate differences between present and past consumptions.

/ / Write Up - Write newsletter consumption feedback section based on computation results.

Attitudes and Appeals

/ / Attitudes - Select an attitude domain to emphasize.

/ / Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/ / Tips - Select conservation tips category to emphasize. Gather tips associated with that area.

Information

/ / Literature - Obtain materials from any additional sources.

CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

DECEMBER

High-intensity Winter Phase

Communication Methods

/_/ Newsletter - Distribute newsletter to residences. Develop a newsletter for January's distribution.

/_/ Coordinator-Resident Contacts - Contact residents, conducting interaction according to schedule.

Activities

/_/ Energy Detective - Distribute and collect relevant energy detective materials.

/_/ Field Trip - Conduct field trip to energy related facility.

Consumption Feedback

/_/ Present Consumption - Read utility meters to collect data on present consumption.

/_/ Temperature Data - Collect data on present month's temperatures.

/_/ Computation - Calculate difference between present and past consumptions.

/_/ Write Up - Write newsletter consumption feedback section based on computation results.

Attitudes and Appeals

/_/ Attitudes - Select an attitude domain to emphasize.

/_/ Appeals - Write newsletter directed at domain area selected.

Conservation Tips

/_/ Tips - Select conservation tips category to emphasize. Gather tips associat ' with that area.

CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

JANUARY

Low-intensity Phase

Communication Methods

☐ Newsletter - Distribute newsletter to residences.

Consumption Feedback

☐ Present Consumption - Read utility meters to collect data on present consumption.

☐ Temperature Data - Collect data on present month's temperatures.

☐ Computation - Calculate difference between present and past consumptions.

☐ Write Up - Write feedback notice based on computation results.

FEBRUARY

Low-intensity Phase

Communication Methods

☐ Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

☐ Present Consumption - Read utility meters to collect data on present consumption.

☐ Temperature Data - Collect data on present month's temperatures.

☐ Computation - Calculate differences between present and past consumptions.

☐ Write Up - Write feedback notice based on computation results.

CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

MARCH

Low-intensity Phase

Communication Methods

/_/ Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

/_/ Present Consumption - Read utility meters to collect data on present consumption.

/_/ Computation - Calculate difference between present and past consumptions.

/_/ Write Up - Write feedback notice based on computation results.

APRIL

Low-intensity Phase

Communication Methods

/_/ Feedback notice - Distribute feedback notice to residences.

Consumption Feedback

/_/ Present Consumption - Read utility meters to collect data on present consumption.

/_/ Temperature Data - Collect data on present month's temperatures.

/_/ Computation - Calculate difference between present and past consumptions.

/_/ Write Up - Write feedback notice based on computation results.

CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

MAY

Low-intensity Phase

Communication Methods

☐ Feedback Notice - Distribute feedback notice to residences. Prepare an extended feedback notice for June.

Consumption Feedback

☐ Present consumption - Read utility meters to collect data on present consumption.

☐ Temperature Data - Collect data on present month's temperatures.

☐ Computation - Calculate difference between present and past consumptions.

☐ Write Up - Write extended feedback notice based on computation results. Project a conservation goal (e.g., 5 or 10% decrease over previous year).

Conservation Tips

☐ Tips - Select conservation tips concerning staying cool during hot summer months when no air conditioning is available.

JUNE

Low-intensity Phase

Communication Methods

☐ Feedback Notice - Distribute extended feedback notice to residences.

Consumption Feedback

☐ Present Consumption - Read utility meters to collect data on present consumption.

☐ Temperature Data - Collect data on present month's temperatures.

☐ Computation - Calculate difference between present and past consumptions.

☐ Write Up - Write feedback notice based on computation results.

CHECKLIST FOR UNITS WITHOUT AIR CONDITIONING

JULY

Low-intensity Phase

Communication Methods

/ / Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

AUGUST

Low-intensity Phase

Communication Methods

/ / Feedback Notice - Distribute feedback notice to residences.

Consumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

/ / Write Up - Write feedback notice based on computation results.

SEPTEMBER

Low-intensity Phase

Communication Methods

/ / Feedback Notice - Distribute feedback notice to residences.

Comsumption Feedback

/ / Present Consumption - Read utility meters to collect data on present consumption.

/ / Temperature Data - Collect data on present month's temperatures.

/ / Computation - Calculate difference between present and past consumptions.

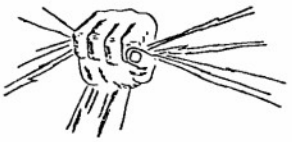
/ / Write Up - Write feedback notice based on computation results.

APPENDIX C

PROVIDE CONSERVATION INFORMATION

- Sample Consumption Information
- Sample Conservation Tips
- Sample Reminder Stickers
- Sample Literature Available
- Sources of Information

SAMPLE CONSUMPTION INFORMATION: ELECTRICAL APPLIANCES



ENERGY CONSERVATION

"Energy Engineering Program goal is to reduce energy use 20% by 1985." From Executive Order 12003.

TYPICAL ELECTRICAL APPLIANCE USAGE DATA

All figures are estimated, using the average comsumption of electricity by a family of four. The cost is based on .037 KWH and does not include the fuel adjustment cost.

Appliance	Average Wattage	Estimated KWH Monthly Consumption	Estimated Monthly Cost
40 Gal water heater (quick recovery)	4500	400	14.94
Washer (30 minutes)	512	10	.37
Dryer (45 minutes)	5000	90	3.36
Ironer	1500	13	.48
Range	11,000	100	3.73
Refrig (12'standard)	241	90	3.36
Refrig (14'frost-free)	615	170	6.34
Refrig (14'cycla-matic)	326	99	3.69
Freezer (15'standard)	341	95	3.54
Freezer (15'frost-free)	440	146	5.45
Dishwasher	1300	30	1.12
Disposer	450	3	.11
Lighting (6 rooms)	-	180	6.72
TV (color)	332	42	1.56
TV (black & white)	237	30	1.12
Iron	1000	10	.37
Coffee Maker	800	7	.26
Toaster	1200	3	.11
Deep Fat Fryer	1450	7	.26
Electric Skillet	1150	14	.52
Microwave Oven	1450	15	.56
Blender	386	1	.03
Mixer	127	1	.03
Trash Compactor	40	4	.14
Vacuum Cleaner	630	3	.11
Window Fan	200	14	.52
		Total	$58.80

SAMPLE CONSUMPTION INFORMATION: TRUE - FALSE AND MULTIPLE CHOICE FORMATS

True or False?

1. The water heater is normally the second largest energy user in the home.

2. A thermostat setting of approximately 160 degrees F is required on your water heater to adequately wash clothes and dishes.

3. "Frost-free" refrigerators use less energy than the normal manually defrosted types.

4. Nighttime setback of thermostats saves heating energy in commercial buildings.

5. Any investments to improve energy efficiency in existing commercial buildings are costly and have little benefit.

ANSWERS:

1. **True.** The electric water heater uses 4,800 kilowatt-hours of electricity in the average household, second only to electric space heating.

2. **False.** If you do not have a dishwasher, there is no need to set the water heater temperature above 120 degrees F. If you have a dishwasher, 140 degrees F is fine, although many are instelled at e higher setting.

3. **False.** A 12 cubic foot refrigerator uses 1,200 kWh annually compared to only 725 kWh for the same sized manual defrost model. However, if a manual model has more than a quarter inch of ice, it can use more energy than "frost-free" models.

4. **True.** When properly applied, maintaining lower building temperatures reduces the heat loss through the building envelope due to the smaller difference between inside and outside temperatures. It also reduces or even eliminates the need to run equipment such as large fans, pumps, chillers, and boilers, thus saving electricity as well as heating fuel.

5. **False.** Changes in the way a building is operated and maintained can reduce energy consumed by 20 to 30 percent. Good investments can be made to get further savings through: personnel training, control system improvement to make environmental equipment operate more efficiently, and centralized controls to maintain and operate systems.

Multiple Choice

1. Microwave ovens on the average will save how much energy when compared with conventional ranges?
(a) 90 to 95 percent (b) 45 to 50 percent (c) 15 to 20 percent (d) nothing.

2. Keeping the indoor temperatures in a residence with air conditioning above 75 degrees F in the summer generally results in the following energy savings per degree:
(a) none (b) 3 to 10 percent (c) 10 to 15 percent (d) over 15 percent.

3. Storm windows or any form of double glazing can cut heat loss through windows by:
(a) 10 percent (b) 30 percent (c) 50 percent (d) 66 percent.

4. The American Institute of Architects estimates that the following percentages are conservative estimates of conservation potential in existing and new buildings, respectively:
(a) 10 and 20 percent (b) 20 and 40 percent
(c) 50 and 25 percent (d) 30 and 60 percent.

5. Lights left on in a commercial building at night could mean:
(a) wasted energy (b) the lights are heating the building
(c) someone is working (d) any of these.

ANSWERS:

1. **(c) 15 to 20 percent.** Although microwave ovens have an energy savings of 75 percent or more for foods such as frozen TV dinners, they can use up to 55 percent more energy than a conventional range surface unit for foods such as summer squash.

2. **(b) 3 to 10 percent.** Computer studies show savings of 3 to 10 percent depending on geographic location.

3. **(c) 50 percent.** Each additional pane of glass will roughly cut the heating loss by a proportionate amount. For example, if triple glazing were used, heat loss would be reduced by two-thirds.

4. **(d) 30 to 60 percent.** 30 percent and 60 percent of the energy used in existing and new buildings, respectivaly, could be saved by more efficient design practices.

5. **(d) any of these.** It could be that energy is being wasted, the lights are being used as a source for the heating system, or simply someone is working. A good energy management program will operate the lights beneficially without waste.

SAMPLE CONSUMPTION INFORMATION: MAJOR APPLIANCES

	Scenario 1 All Electric Appliances*		Scenario 2 Electric & Gas Appliances**	
Appliance	Kwh/Yr.	Cost/Yr.	Therm/Yr.	Cost/Yr.
Range and Oven	1,200	$ 60.00	105	$ 26.25
Water Heater	5,000	250.00	325	81.25
Clothes Dryer	1,000	50.00	73	18.25
Air Conditioner	3,000	150.00	273	68.25
Heating	10,180	509.00	400	100.00
Misc. Gas	---		200	50.00
			Kwh/Yr.	
Dishwasher	25	12.50	25	12.25
Freezer	1,500	75.00	1,500	75.00
Refrigerator	1,500	75.00	1,500	75.00
Television	500	25.00	500	25.00
Misc. Electric and Lighting	3,500	175.00	3,500	175.00
Total Cost		$1,381.50		$706.25

*Cost per kwh = $.05
**Cost per therm = $.25

SAMPLE CONSUMPTION INFORMATION: ELECTRICAL APPLIANCES

Portable Electric Housewares Energy Consumption

Product	Average operating wattage	Uses per year	Time/use (min.)	Hr/yr	Pct. actual "on" time *	kWh/yr
Baby Food Warmer	165	1092	7.3	131	100	22
Blender	300	293	0.5	3	100	0.9
Broiler	1140	100	45	75	100	85
Can Opener	100	1000	0.2	3	100	0.3
Clock	2.5	Cont.	Cont.	8760	100	22
Blanket	150	250	480	2000	50	150
Coffeemeker						138
Brew Cycle	600	600	15	150	100	90
Warm Cycle	80	600	60	600	100	48
Coffeemaker Urn						15
Brew Cycle	1200	18	30	9	100	11
Warm Cycle	100	18	120	36	100	4
Corn Popper	575	100	9	15	100	9
Curling Iron	40	300	10	50	82	1.6
Cooker-Fryer/ Dutch Oven	1200	35	60	35	54	23
Egg Cooker	550	270	5	23	100	13
Fondue/Chafing Dish	800	25	60	25	46	9
Fry Pan	1200	180	45	135	62	100
Griddle	1200	100	30	50	76	46
Hair Clipper	10	200	10	33	100	0.3
Hair Dryer - Sft. Bon.	400	100	45	75	100	30
Hair Dryer - Hard Bon.	900	100	30	50	100	45
Hair Dryer - Hand Held	600	250	10	42	100	25
Hair Setter/Curler	350	155	15	39	100	14
Heating Pad	60	52	120	104	54	3
Ice Cream Freezer	130	6	45	5	100	0.7
Ice Crusher	100	100	3	5	100	0.5
Iron	1100	52	120	104	52	60
Juicer	90	400	1	7	100	0.6
Kettle	1500	600	5	50	100	75
Knife	95	90	5	8	100	0.8
Knife Sherpener	40	52	5	4	100	0.2
Lighted Mirror	20	650	10	108	100	2
Massager-Hand Held	15	104	10	17	100	0.3
Mixer-Hand	80	150	5	13	100	1
Mixer-Stand	150	75	8	10	100	2
Roaster	1425	12	360	72	58	60
Rotisserie	1400	26	120	52	100	73
Shaver	15	365	5	30	100	0.5
Shaving Cream Dispenser	60	365	1	6	100	0.4
Slow Cooker	200	104	400	693	100	139
Table Range	1100	175	35	102	100	112
Table Clothes Washer	95	104	24	42	100	4
Toaster	1100	700	3	35	100	39
Toaster-Oven						93
(Toasting)	1500	500	3	25	100	
(Oven)	1500	280	30	140	26	
Toothbrush	1.1	Cont.	Cont.	8760	100	10
Waffle Iron/ Sandwich Grill	1200	52	30	26	80	20
Warming Tray	140	26	120	52	100	7

* Factor for the effect of on-off cycling in thermostatically controlled products.
Source: Association of Home Appliance Manufacturers

SAMPLE CONSERVATION TIPS: SPACE HEATING AND COOLING, WATER HEATING, LAUNDRY APPLIANCES, KITCHEN APPLIANCES, LIGHTING, MINI-CONSUMERS

CLIMATE CONTROL

Climate control, in the form of heating and cooling our homes, is by far the number one household energy consumer. For this reason, climate control needs to be the major emphasis of the energy conservation effort. The following is a list of selected conservation tips concerning household climate control. Although the heating suggestions will be universally beneficial, the cooling tips will generally assist only those residents with cooling devices (e.g., air conditioners). However, residents of non air-conditioned units may also find several of the cooling tips helpful in maintaining a desired indoor temperature.

Air Conditioning

1. Keep Temperature at 78° or Higher. The American Society of Heating, Refrigeration and Air-Conditioning Engineers has found that 78° is a comfortable temperature for most people during the summer.

2. Close Draperies, Blinds, and Shades. To keep sunlight out and help reduce heat build-up, close your drapes, blinds, and shades during the hottest part of the day.

3. Cook and Use Other Heat-Generating Appliances in the Early Morning and Late Evening Hours. The heat generated by these activities adds to the load on your air conditioner.

4. Keep Windows and Doors Closed during the Hottest Hours of the Day. Keeping the hot air outside prevents the overloading of your air conditioner.

5. Turn Thermostat Setting Warmer or Off. When away from home for 24 hours or more, either turn the thermostat to a higher temperature setting or turn it off completely.

6. Set the Thermostat to a Higher Temperature Setting. If you are to be away from home for a substantial part of the day, turn the thermostat up 3 to 5 degrees.

7. Open Windows Instead of Using Your Air Conditioner. On cooler days and during cooler hours open your window instead of using the air conditioner.

8. Dress for the Warmer Temperatures. Lightweight open-weave fabrics are most comfortable in warmer weather.

9. Keep Lights Low Or Off. Electric lights generate heat and add to the load on your air conditioner.

10. Close Off Unused Rooms. Decrease the load on the air conditioner.

11. Use Vents and Exhaust Fans. Remove heat and moisture from the kitchen, laundry, and bathroom as it is generated. Avoid running exhaust fans when not needed.

12. Don't Set the Thermostat Cooler than Normal When Turning on the Air Conditioner. The air conditioner will not cool any faster when turned to a cooler-than-normal setting.

13. Replace Air Conditioning Filters. Dust and dirt particles can block air flow and make your air conditioner work harder and less efficiently.

14. Set the Fan on Continuous in very Humid Weather. When it is humid, running the fan continuously will remove more moisture from the air.

Heating

1. Use Moderate Heat. The recommended heating termperature during the day is no higher than 68 degrees; at night, 60 or lower. Each degree lower means heat savings of 3 percent over a 24-hour period.

2. Dress Appropriately For Cooler Temperatures. For comfort in cooler indoor temperatures, use the best insulation of all - warm clothing. Closely woven fabrics are best. According to the U.S. Department of Energy, such fabrics add at least a half degree of warmth. A light long-sleeved sweater equals almost 2 degrees in added warmth; a heavy long-sleeved sweater adds about 3.7 degrees.

3. Capture "Free" Solar Energy. When the sun is shining, open drapes and shades to increase solar radiation.

4. Prevent Heat Loss. Drapes, shades, curtains and screens help keep the heat indoors. Close off windows at night when heat loss through them is greatest.

5. Use Exhaust Fans Sparingly. Kitchen, bath, and other ventilating fans can blow away an entire houseful of warmed air in just an hour.

WATER HEATING

Water heating is the second largest home energy user. Following these few simple suggestions can greatly reduce hot water consumption.

1. Use Cold Water for Disposals. This saves the energy required to heat the water, and aids in getting rid of grease.

2. Fix the Drips. One drop of water a second is nearly 200 gallons a month. That's energy down the drain!

3. Take Short Showers. A 5-minute shower saves 1/3 of the water used in a tub bath. Assuming half hot water, just one shower substituted for one bath per day would save about 2,000 gallons of hot water in a year.

4. Limit Running Water. Don't leave the water running while you shave. When handwashing dishes, avoid running hot water continuously for rinsing.

5. Avoid Partial Loads. Wash only full loads in your clothes washer and dishwasher.

LAUNDRY APPLIANCES

Clothing washers and dryers are among the largest energy consumers in the home. Washers, especially because of their use of hot water, require a great deal of energy for operation. Dryers, whether gas or electric, require considerable energy to increase air temperature. Through the following simple practices residents can decrease household energy consumption substantially.

1. Fill Washer and Dryer Completely. Fill your washer and dryer completely, but don't overload them. If they have small-load attachments or special low water levels, use these for smaller loads. It takes nearly as much energy to wash and dry a small load as it does a full load.

2. Select Correct Wash Time. Select a wash time to match load and soil levels. Regular clothes need only a 10-15 minute washing cycle.

3. Select Correct Wash Water Temperature. Use warm or cold water whenever possible. Cold or warm water can be used to wash permanent press articles, washable woolens and lightly soiled articles. In addition to energy savings, cold water is more effective than hot water in removing lint collected on garments. Use a cold water rinse.

4. Use Correct Amount of Detergent. Follow the instructions on the detergent box. Oversudsing makes your machine work harder and uses more energy.

5. Keep Filters Clean. Clean the lint filter on your dryer after each use. Lint impedes air flow in the dryer, lengthens drying time and uses more energy.

6. Dry Clothes in Consecutive Loads. Occasional drying uses more energy to warm the dryer up to the desired temperature each time you begin.

7. Use "Fluff" or "Air Only" Setting. If your dryer has one, "fluff" and "air only" settings can be used for permanent press fabrics, saving your clothing and watts.

8. Use Washer and Dryer in the Early Morning or Late Evening Hours. The heat generated by your laundry equipment will add to the already warm temperature of your summer home.

KITCHEN APPLIANCES

The kitchen, being the location of so many major appliances, including the refrigerator/freezer, dishwasher, oven, and range, is a key site for household energy conservation. Not only do each of these appliances consume considerable energy, but several kitchen functions also include the use of large quantities of hot water. Thus, conservation in the kitchen is extremely important in reducing energy consumption. The following list describes appropriate conservation practices associated with each kitchen appliance.

Oven/Range

1. Plan Complete Oven Meals. A complete meal can be cooked for little more energy than an individual item.

2. Don't Peek. Opening an oven door unnecessarily can result in the loss of as much as 20% of the heat.

3. Cover Pots and Pans. Covered pots and pans retain the heat better, allowing for lower cooking temperatures and faster cooking times. Also, use a pot or pan that is the same size or larger than the burner. A pot too small for the unit will allow extra heat to escape into the kitchen, a situation especially undesirable during the warm summer months.

4. Use the Oven. For foods requiring long cooking periods, such as stews, use your oven instead of the range top. Surface units stay on the whole time they are in use; the oven is on for only part of each hour it's used. The rest of the time it "coasts" because its insulation holds heat in. Another advantage is that less heat is dissipated into the air when the oven is used instead of the range top, reducing heat buildup in a warm summer home.

5. Use a Moderate Flame. When cooking with the rangetop burner, use moderate flame settings to conserve gas.

6. Use a Microwave Oven and Portable Cooking Equipment. For small or specialized jobs, microwave ovens and portable cooking equipment, such as broilers, skillets coffee pots, and toasters, generally use less energy than your oven or range top would for the same time.

7. Use the Exhaust Fan. The exhaust fan can remove hot moist air from the kitchen, allowing your air conditioner to efficiently maintain a comfortable household temperature.

Refrigerator/Freezer

Refrigerators and freezers operate around the clock, so proper use and maintenance is particularly important.

1. Keep Correct Temperature Settings. The fresh food compartment of the refrigerator should be kept at about 38° to 40°F. The freezer section should be maintained at about 5°F. If you have a separate freezer for long-term storage, it should be kept at 0°F. Use a low cost thermometer to check these temperatures.

2. Check Refrigerator Door Gaskets. If you place a dollar bill between the door and cabinet and pull it straight out, there should be a slight drag if the gasket is fitting properly. If it slips through easily, you probably need to adjust the hinges and/or replace the door gasket.

3. Minimize Door Openings. Plan ahead for what you'll need to remove or replace, especially for freezers. Keep the door open as briefly as possible. An open door allows the cool air to flow out of the lower part of the space, and warm air flows in at the top to take its place. The warm air requires the unit to use more electricity to cool it down to the thermostat setting.

4. Allow Space for Air Flow around the Refrigerator. The refrigerator should be kept at least three inches away from the wall to permit the cooling coils to operate efficiently.

5. Defrost Regularly (If Not Frost-Free). When frost becomes more than one-fourth inch thick, it acts as an insulator, making your refrigerator or freezer run longer to accomplish the required cooling.

6. Don't Overload Refrigerators. For best cooling efficiency, air must be able to circulate around each container.

7. Keep Freezer Full. Frozen food helps keep the air cool in your freezer, but you must allow space around containers for the air to circulate.

8. Keep Condenser Coils Clean. These are at the bottom or rear of the refrigerator or freezer. If they are allowed to accumulate dust and dirt, heat transfer will be impaired and your refrigerator will run longer to maintain its thermostat setting.

Dishwasher

Efficient use of your dishwasher can not only save energy, water and detergent, but get your dishes cleaner as well.

1. Fill to Capacity. Operate your dishwasher only when it is filled to capacity (but not over-filled). This will get the most cleaning from each measure of detergent, water, and energy.

2. Use Dishwasher at Night. In hot weather use the dishwasher at night to avoid adding heat to already warm daytime temperatures.

3. Use Short Washing Cycle. Use the shortest washing cycle that will get your dishes clean. You can help the dishwasher by scraping and rinsing dishes before placing them in the dishwasher. Dishwasher pre-rinse cycles are energy wasters, so avoid them when you can.

4. Air Dry Dishes. Let your dishes air dry by turning the dishwasher off before the drying cycle if your dishwasher does not have a button for an air dry cycle. Heated drying uses additional electricity. Elimination of heated drying can cut energy consumption by one-third to one-half and reduce the heat spilled by the dishwasher into the house.

5. Wash Dishes by Hand. Washing and rinsing small quantities of dishes by hand can save energy, but hand washing three times a day can use more hot water and energy than one load a day in an automatic dishwasher. Avoid wasting energy while rinsing under running water--use a dishpan of hot water for rinsing.

LIGHTING

After considering the major appliances, the next most significant of the energy consumers is lighting. According to the Federal Energy Administration, lighting consumes over 16 percent of all residential electricity. Thus, careful use of lighting is of definite importance in the reduction of residential energy consumption. The following few tips provide suggestions for optimal lighting practices.

1. Turn Lights Off when Leaving a Room. A 100-watt bulb burning one day requires a pint of oil at the electric generating plant.

2. Watch Lighting Wattage. One large bulb is better than several small ones. It takes six 25-watt bulbs to get light equal to a 100-watt bulb and the six 25-watt bulbs use 50 percent more electricity. Correct wattage is important for safety and detailed work but you can save energy by using lower wattage bulbs for decorative and accent lighting.

3. Keep Light Fixtures Clean. Clean, dust free light fixtures maximize lighting and use energy efficiently.

MINI CONSUMERS

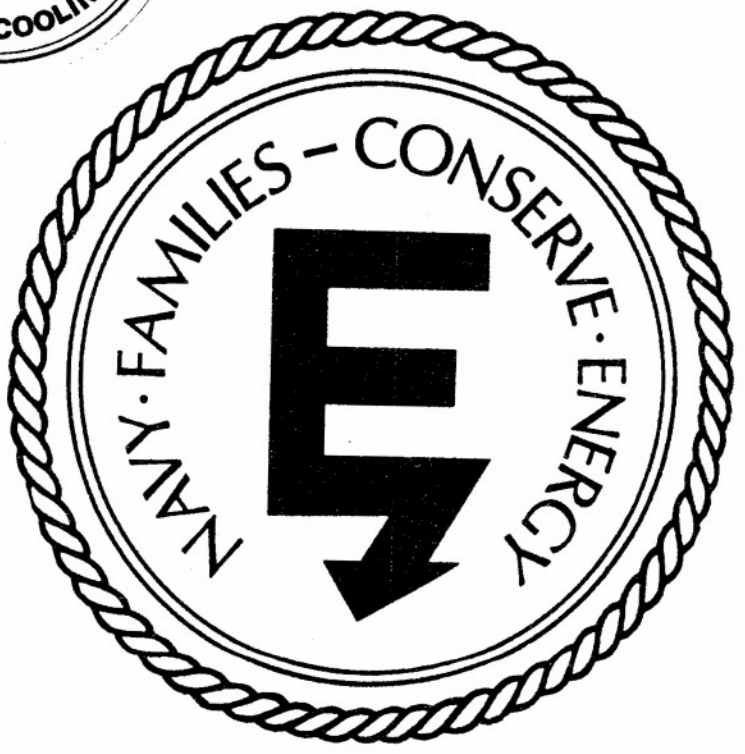
Many "luxury" household appliances are actually minimal energy consumers. Additionally, several of these "mini" consumers can be energy savers through their replacement of larger appliances. Loosely quoting one utility's conservation advice.

> "Everybody's favorite target seems to be the electric toothbrush. A lot of people pat themselves on the back for hanging it up. But a continuous charge toothbrush costs less than 5 cents per month to operate-no matter how many times you brush each day.
>
> Eliminating that is hardly a savings you can sink your teeth into. The electric shaver is another conservation victim. Yet you can take a five-minute electric shave every day for the next 7 years and 4 months for a dime. It would cost you more to run hot water and shave with a straight edge.
>
> In the kitchen, things like toasters, crockpots, frypans and broiler ovens take a lot of heat. Yet they can actually be big savers. You can cook with all of them--sometimes whole meals--for a fraction of the energy you'd use with your range or oven.
>
> A microwave oven seems like a space age luxury. But with small quantities of food it can cut cooking energy costs by 75%, because it's on for such a short time. Electric can openers and popcorn makers are good guys too."

The following list exemplifies the relatively low energy consumption of many of these appliances. Compare and contrast these figures with the consumption of major household appliances (see Appendix D, page 112, for additional consumption data). An approximate cost per kilowatt hour is currently 10 cents.

Minor Consumers	Uses/Year	KWH/Year
Baby Food Warmer	1092	22
Blender	293	0.9
Can Opener	1000	0.3
Clock	Continuous	22
Blanket	250	150
Corn Popper	50	5
Fry Pan	180	100
Griddle	100	46
Hair Dryer - Hand Held	250	25
Iron	52	60
Knife	90	0.8
Mixer - Hand	150	1
Roaster	12	60
Rotisserie	26	73
Shaver	365	0.5
Slow Cooker	26	35
Toaster	700	39
Toaster-Oven	780	93
Toothbrush	Continuous	10
Warming Tray	26	7

SAMPLE REMINDER STICKERS



TR 82-22-2

SAMPLE LITERATURE: ADULT BOOKLET

Answers to forty of the most commonly asked questions about electricity.

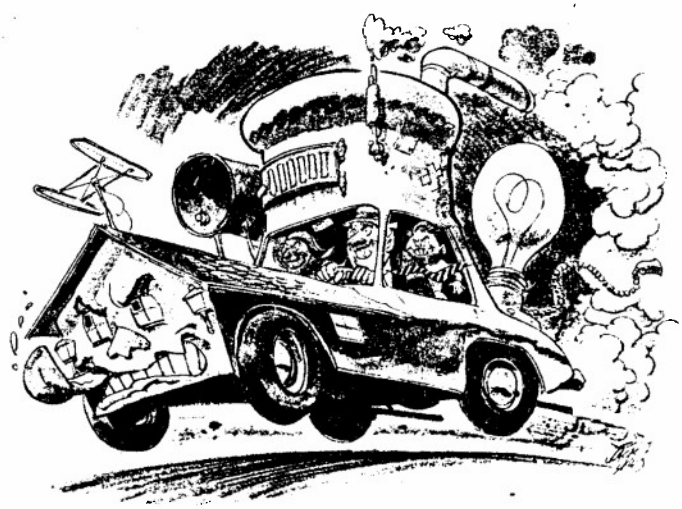
Electricity is the most versatile form of energy. But it's also the most mysterious. We can't see it. We can't smell it. We can't hear it. Here are answers to some of the questions people often ask about electricity.

1. Where does electricity come from?

Electricity is electrons in motion. It occurs in nature in the form of lightning, electric eels, and even the small shock you sometimes get when you touch a doorknob. Most of the electricity we use in our everyday lives is made in a power plant by spinning a magnet inside coils of wire. This puts electrons in motion and creates a flow of electricity. It's made the same way, whether it's produced in a small coal-burning power plant or the most modern nuclear plant.

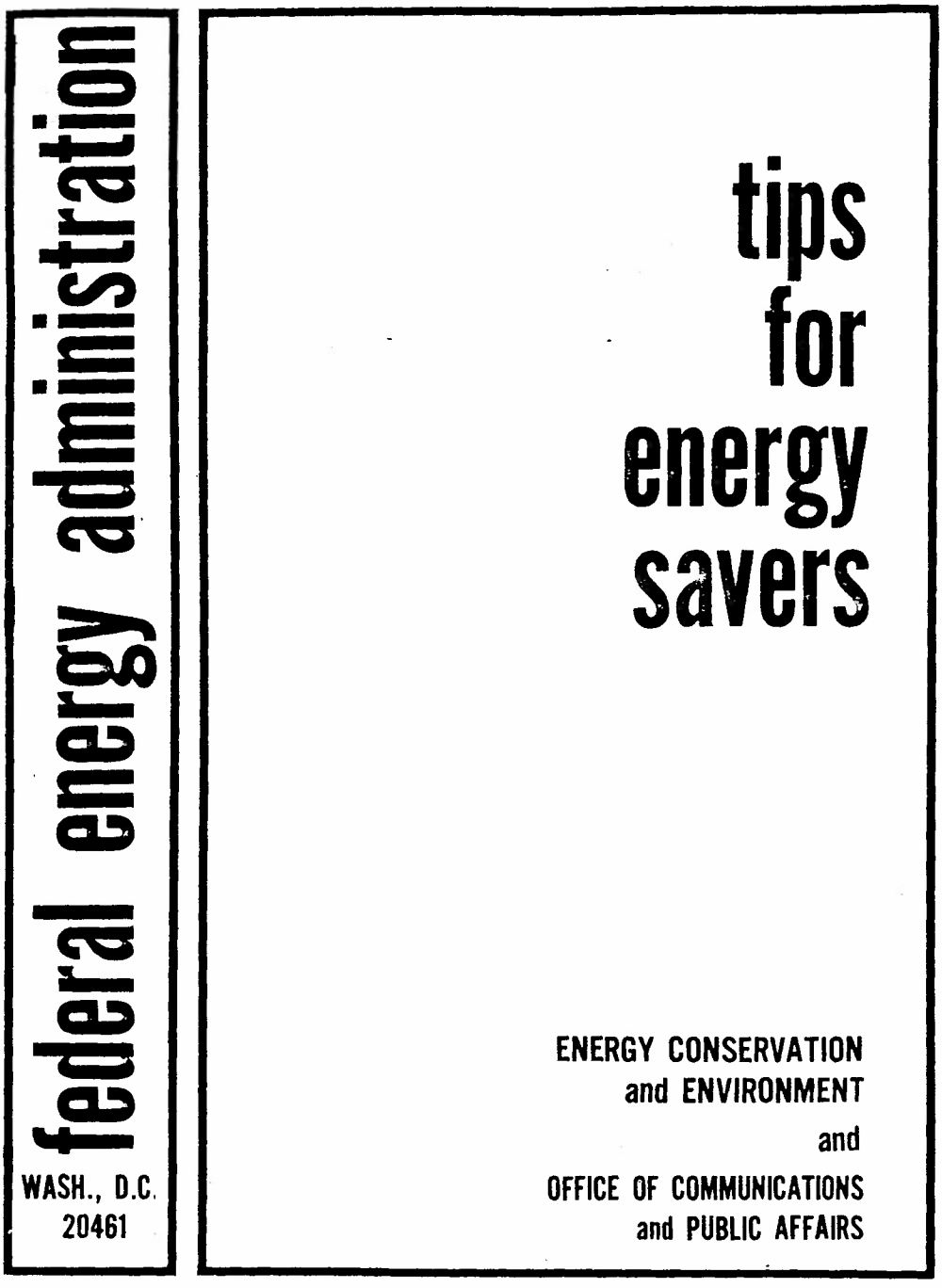
TIPS FOR ENERGY SAVERS

IN AND AROUND THE HOME
ON THE ROAD
IN THE MARKETPLACE

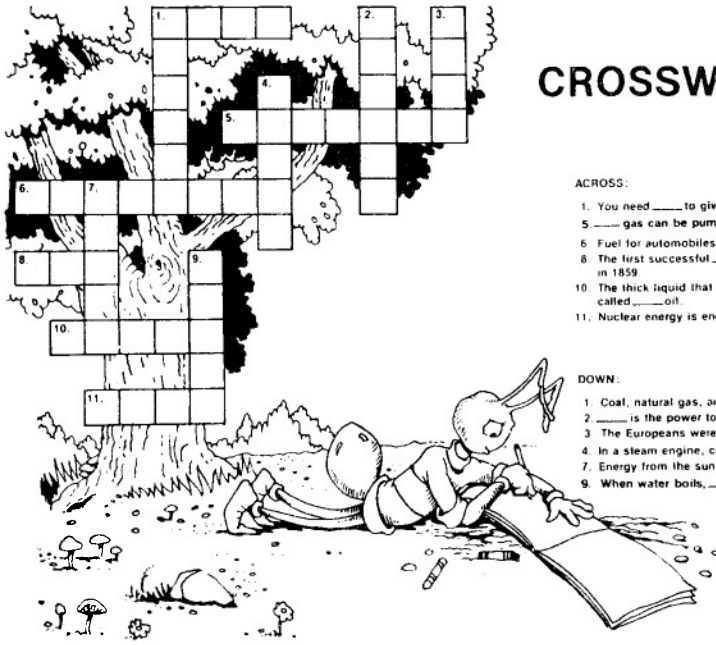


DON'T BE FUELISH.

SAMPLE LITERATURE: ADULT BOOKLET



ENERGY AWARENESS AND CONSERVATION CLIPSHEET



CROSSWORD PUZZLE

CLUES

ACROSS:

1. You need ____ to give your body energy.
5. ____ gas can be pumped to your home for heating and cooking.
6. Fuel for automobiles.
8. The first successful ____well was drilled in the United States in 1859.
10. The thick liquid that is pumped from underground pools is called ____oil.
11. Nuclear energy is energy released when an____is split apart.

DOWN:

1. Coal, natural gas, and oil are called____fuels.
2. ____ is the power to make things move.
3. The Europeans were the first to mine____for heating.
4. In a steam engine, coal is burned to heat____.
7. Energy from the sun.
9. When water boils, ____ is released to work for us.

ACROSS
1. Food
5. Natural
6. Gasoline
8. Oil
10. Crude
11. Atom

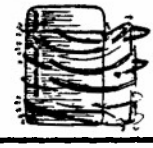
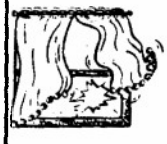
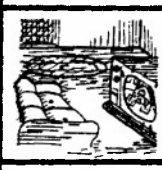
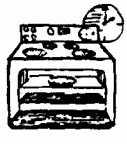
DOWN
1. Fossil
2. Energy
3. Coal
4. Water
7. Solar
9. Steam

Kids -- Have fun with Energy Ant!

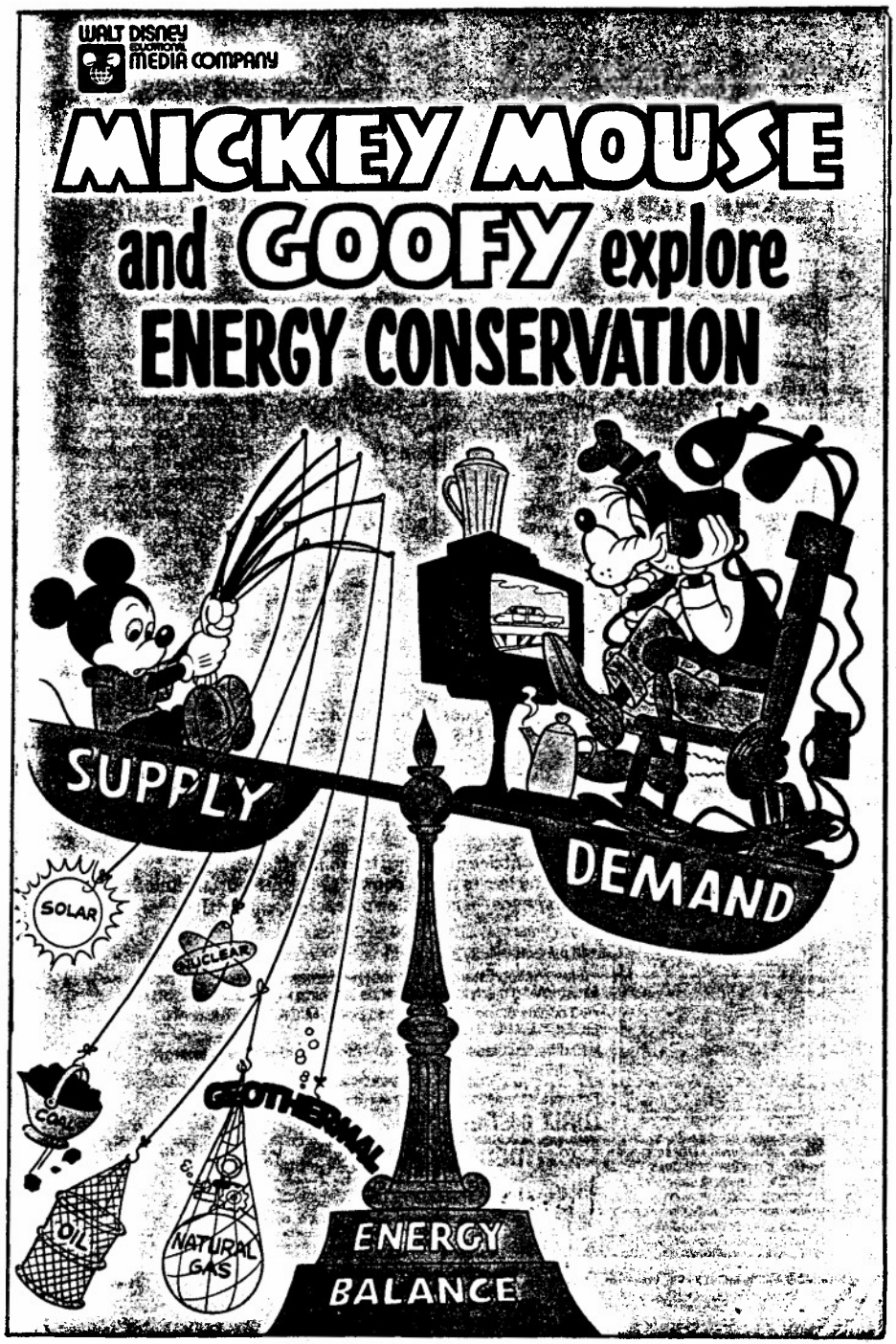
Penny Eater Game

Are you an energy waster? If you aren't sure, the short Quiz will help you find out! You'll probably learn a few new energy saving ideas.

All you have to do is read through this list and compare the two statements; then decide which ones waste energy and which ones save energy! Just circle the energy savers below!! GOOD LUCK!!

	You leave the door open.	1		Open and close the door quickly.
	Fit the pan to right size eye.	2		Put a little pan on a big eye.
	Have a broken window.	3		Cover the hole with cardboard, paper, rags or foil. Stop the cold air.
	Have a crack under door.	4		Stuff rags, paper, or a rug in crack under doors.
	Turn off TV or radio when nobody is watching or listening.	5		The TV or radio is left on in an empty room.
	Have window up in winter.	6		Keep windows closed, cover them with plastic.
	Cook one food at a time in oven.	7		Cook many foods in oven at same time.

SAMPLE LITERATURE: CHILDREN'S COMIC BOOK



SOURCES OF INFORMATION

1. Consumer Information Center, Pueblo, Colorado 81009 – The Consumer Information Center is the source of federal government publications, including many on energy-related matters. Write for a free copy of the "Consumer Information Catalog."

2. Consumer Organizations – Various consumer organizations, such as the Consumer Union, publish energy-related materials.

3. Elementary and Secondary School Systems – School systems often use energy-related materials as part of their curriculum.

4. Libraries – Libraries will have copies of most government publications, as well as offer energy-related publications.

5. Manufacturers Associations – Manufacturers associations may provide literature on various energy-related products.

6. Oil Companies – Oil companies often have energy conservation-related literature.

7. State Government – State governments may publish energy-related literature.

8. United States Department of Energy, Washington, D.C. 20585 – The Department of Energy produces a variety of energy-related information, much of which can be obtained through the Consumer Information Center (see above).

9. Universities and Colleges – Universities and Colleges may have conservation centers which can serve as sources of information.

10. Utility Companies – Utility companies produce literature on energy conservation. Local companies can be contacted for large quantities of such information.

APPENDIX D

SET CONSERVATION GOALS

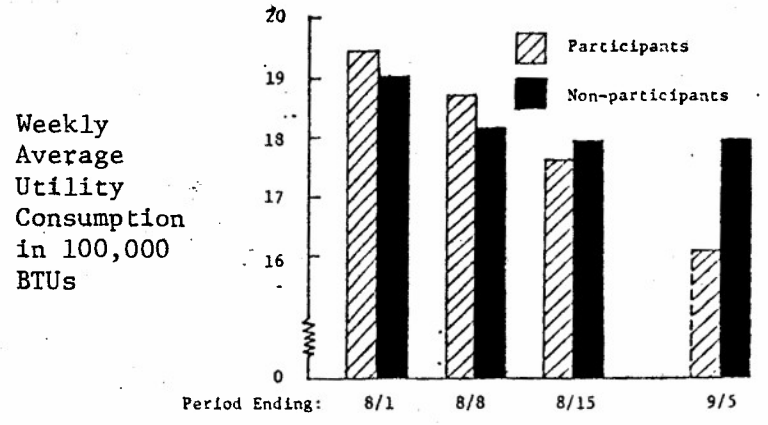
- Sample Newsletter Announcement
- Setting Family Conservation Goals
- Sample Log Sheets

SAMPLE NEWSLETTER ANNOUNCEMENT

ENERGY CONSERVATION RESULTS

There's encouraging news in the results for the first two-week period of the energy conservation study at Corry. Average utilities used by Corry participants decreased over 4% compared to non-participants, even though I've only been able to visit half the "participants" so far. As the chart shows, participants actually began with a handicap in average household utilities used, but by the end of the period participants were using less than non-participants. This is a good start and nearly achieved our goal of 5% for the first two-week period. The chart also shows there was an overall decline for both groups, due to milder weather.

UTILITY CONSUMPTION OF PARTICIPANTS COMPARED TO NON-PARTICIPANTS



These results are encouraging for the future, because with everyone doing their share we'll be able to more than double the savings. I also have more tips (see back) and things for the children to do which will make further savings possible, so our new goal for the second period is a 10% savings. I know we can do it if everyone does their bit to "Make Every Kilowatt Count."

SETTING FAMILY CONSERVATION GOALS

A simple procedure for family goal setting and performance monitoring is presented below. This procedure is built on the idea that all members of the family contribute to household energy consumption, so all should participate in determining how usage should be reduced and all should help carry out that plan.

First, a joint family review should be conducted. This review should focus on a particular area, e.g., kitchen and cooking, possibly using a checklist or list of suggested conservation practices (see Appendix C) supplied by the energy conservation coordinator. Recommended practices which are already used should be noted, as well as those which are not but could be. Congratulations are in order for good practices already adopted.

Second, the practices not used should be surveyed and assigned priorities based on their anticipated consumption impact in that particular family. For example, avoiding preheating the oven may be a possible area for conservation by one family, but if the family does not bake much, covering pots and pans might be assigned a higher priority. Priorities need not be rank orderings; a three category system may be sufficient (most important, worthwhile, low value). Using the priorities select the practices to be emphasized during the next consumption period.

Third, set a level of performance to be sought during the upcoming consumption period. At first glance it would seem that if "lights are to be turned off when leaving a room", the only satisfactory level of performance is 100% (every time). However, this is unrealistic, because we forget, there may be exceptions, and so forth. The goal should be challenging, but realistic (e.g., 50% or 75%). Where the practice is primarily a matter of knowledge (e.g., that covering pots and pans can save energy) a high goal may be realistic, but where old habits come into play it may be harder to change our practices so a lower goal may be realistic.

Fourth, develop a log or record form on which tallies can be made. All that is required is a list of the goals and two columns: "done" and "not done". A tally sheet and pencil should be placed in an appropriate location for each of the goal behaviors.

Fifth, each time a family member is in the situation, she/he should tally whether they did the goal behavior or not (without prompting). Daily log sheets could be summarized on one or more charts with daily percentages plotted for each of the goal behaviors. When the consumption period is complete the daily records or summary chart should show whether the goals were achieved or any improvement made.

Sixth, the family should conduct another joint review, focussing on their performance of the goal behaviors during the consumption period. Based on the level of this performance, each goal should be reset so as to maintain or improve on their utility consumption practices. Also, during this joint review the family should examine a new area (e.g., water heating) and set new goals following the same six steps.

NOTE FOR FAMILIES WITH INDIVIDUAL METERS: By reading one's own meters a family may set goals and monitor their own total consumption. A period length may be selected (e.g., one week), readings taken at the beginning and end of the period, and the difference calculated. The first period consumption may be used as the "baseline" or standard against which to compare consumption during succeeding weeks. To achieve savings requires knowledge of how energy is being used, so some record-keeping may be desirable (see sample forms in this appendix). Experiments may be run where changes in family usage (e.g., shorter showers, night setback of thermostat) are tried and their effects on the overall total noted. Some adjustment for variations in temperature may be required (see Appendix I).

SAMPLE LOG SHEET FOR ELECTRICAL CONSUMPTION

MONDAY

_____ a.m.
_____ p.m.

NOTES:

TUESDAY

_____ a.m.
_____ p.m.

NOTES:

WEDNESDAY

_____ a.m.
_____ p.m.

NOTES:

THURSDAY

_____ a.m.
_____ p.m.

NOTES:

FRIDAY

_____ a.m.
_____ p.m.

NOTES:

SATURDAY

_____ a.m.
_____ p.m.

NOTES:

SUNDAY

_____ a.m.
_____ p.m.

NOTES:

SAMPLE LOG SHEET FOR APPLIANCE USAGE

LOG SHEET

Name: _____

Street Address: _____

MONDAY	TUESDAY	WEDNESDAY
OVEN: _____ HOURS	OVEN: _____ HOURS	OVEN: _____ HOURS
RANGE: _____ HOURS	RANGE: _____ HOURS	RANGE: _____ HOURS
TELEVISION: _____ HOURS	TELEVISION: _____ HOURS	TELEVISION: _____ HOURS
HOUSE VACANT: _____ HOURS	HOUSE VACANT: _____ HOURS	HOUSE VACANT: _____ HOURS
SHOWER/BATH: _____ TIMES	SHOWER/BATH: _____ TIMES	SHOWER/BATH: _____ TIMES
DISHWASHER: _____ TIMES	DISHWASHER: _____ TIMES	DISHWASHER: _____ TIMES
CLOTHES WASHER: _____ TIMES	CLOTHES WASHER: _____ TIMES	CLOTHES WASHER: _____ TIMES
CLOTHES DRYER: _____ TIMES	CLOTHES DRYER: _____ TIMES	CLOTHES DRYER: _____ TIMES
TEMPERATURE AT _____ A.M. P.M.	TEMPERATURE AT _____ A.M. P.M.	TEMPERATURE AT _____ A.M. P.M.
WAS _____ °F	WAS _____ °F	WAS _____ °F
NOTES:	NOTES:	NOTES:

THURSDAY	FRIDAY	SATURDAY	SUNDAY
OVEN: _____ HOURS	OVEN: _____ HOURS	OVEN: _____ HOURS	OVEN: _____ HOURS
RANGE: _____ HOURS	RANGE: _____ HOURS	RANGE: _____ HOURS	RANGE: _____ HOURS
TELEVISION: _____ HOURS	TELEVISION: _____ HOURS	TELEVISION: _____ HOURS	TELEVISION: _____ HOURS
HOUSE VACANT: _____ HOURS	HOUSE VACANT: _____ HOURS	HOUSE VACANT: _____ HOURS	HOUSE VACANT: _____ HOURS
SHOWER/BATH: _____ TIMES	SHOWER/BATH: _____ TIMES	SHOWER/BATH: _____ TIMES	SHOWER/BATH: _____ TIMES
DISHWASHER: _____ TIMES	DISHWASHER: _____ TIMES	DISHWASHER: _____ TIMES	DISHWASHER: _____ TIMES
CLOTHES WASHER: _____ TIMES	CLOTHES WASHER: _____ TIMES	CLOTHES WASHER: _____ TIMES	CLOTHES WASHER: _____ TIMES
CLOTHES DRYER: _____ TIMES	CLOTHES DRYER: _____ TIMES	CLOTHES DRYER: _____ TIMES	CLOTHES DRYER: _____ TIMES
TEMPERATURE AT _____ A.M. P.M.	TEMPERATURE AT _____ A.M. P.M.	TEMPERATURE AT _____ A.M. P.M.	TEMPERATURE AT _____ A.M. P.M.
WAS _____ °F	WAS _____ °F	WAS _____ °F	WAS _____ °F
NOTES:	NOTES:	NOTES:	NOTES:

SAMPLE LOG SHEET FOR DAILY ELECTRICAL CONSUMPTION AND APPLIANCE USE

NUMBER OF MEALS: _____BREAKFASTS _____LUNCHES _____DINNERS

TOTAL OVEN HOURS: _____ TOTAL MICROWAVE OVEN HOURS: _____

TELEVISION SET #1 _____HOURS TELEVISION SET #2 _____ HOURS

DISHWASHER: _____USES

CLOTHES WASHER: _____ USES CLOTHES DRYER: _____USES

HOURS OF HOUSE VACANCY: _____

HOURS OF CENTRAL AIR CONDITIONER SETBACK: _____

SETBACK TO: _____°F

TEMPERATURE AT: _____ A.M. P.M. _____ °F, AT: _____ A.M. P.M. _____ °F

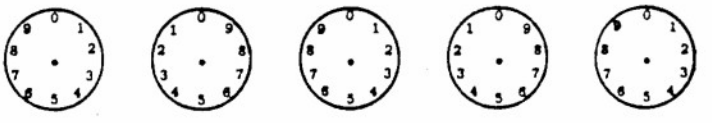
NUMBER OF SHOWERS: _____ NUMBER OF BATHS: _____

ELECTRIC METER: Digital: _____

_____ A.M. _____ P.M. Or Dial:

GAS OR FUEL OIL METER: Digital: _____

_____ A.M. _____ P.M. Or Dial:



NOTES (Include any other uses you think could be significant):

_____

_____

_____

APPENDIX E

EXPRESS NAVY CONCERN

- Sample Newsletter Feature Note: Biofouling
- Sample Newsletter Feature Note: Alternative Fuels
- Examples of High Level Navy Concern

SAMPLE NEWSLETTER FEATURE NOTE:
BIOFOULING

The Department of Defense is the single largest energy consumer in the U.S. This fact has led the services to look for ways to reduce energy consumption. One project completed by the Navy found that the fuel efficiency of ships is reduced as much as 30 percent by organisms that grow on ships' hulls (biofouling), thus creating additional drag during operations. As a result of this finding the Navy has established a program of underwater hull cleaning in order to increase the fleet's fuel efficiency. They are also currently experimenting with special coatings for hulls to eliminate biofouling.
Let's each do our share to conserve energy resources.

ALTERNATIVE FUELS

The development of alternative fuels has been an important concern of the military services. One project refined 5 types of military compatible fuel from 10,000 barrels of crude shale oil. This fuel was then successfully used to power a jet, a ship and land vehicles. This study is important because it has been estimated that the U.S. has the largest supply of recoverable oil shale in the world. This supply of oil shale can produce over 1 trillion barrels of crude oil. The extensive development of this resource has yet to be undertaken but the future looks promising.
Let's each do our share to conserve energy resources.

EXAMPLES OF HIGH LEVEL NAVY CONCERN

THE SECRETARY OF THE NAVY
WASHINGTON D.C. 20350

5 June 1980

ENERGY AWARENESS WEEK
1980

The third annual Department of the Navy Energy Awareness Week will be observed 27 October - 2 November 1980. During this period all naval commands and activities will have the opportunity to reach out and inform their military and civilian personnel of the critical importance of energy awareness to our mission and to our personal lives. Many think of energy awareness in terms of energy conservation. Certainly, understanding the need to conserve energy is a vital part of being aware, but awareness also includes an understanding of how national and worldwide energy problems impact on our daily lives and, more importantly, will impact our future.

Our petroleum energy supplies are increasingly being acquired through imports (nearly 50 percent of our total requirement) and the vulnerability of these imports is increasingly apparent, particularly in the Middle East. Furthermore, we continue to experience unprecedented increases in energy costs. Higher prices for crude oil and other energy forms are reflected in total Navy energy costs which have gone from 3.5 percent of the Navy budget in 1978 to a projected 7.4 percent in 1980. Soaring energy costs and supply vulnerability can impact heavily on the future operational readiness of our naval forces and on our personal lives.

The theme selected for this year's Energy Awareness Week, "Save Energy Today - Protect our Tomorrow," sums up the situation well. Only by becoming aware of the need to save all of the energy we can will we improve our chances of having enough energy in the future. Success in this most important effort demands involvement by all members of the naval community. I challenge each of you to participate fully in this year's Energy Awareness Week.

Edward Hidalgo
Secretary of the Navy

Chief of Naval Operations
Washington, D.C. 20350

Commandant of the Marine Corps
Washington, D.C. 20380

"Save Energy Today - Protect Our Tomorrow"

The Department of the Navy's third annual Energy Awareness Week will be observed 27 October - 2 November 1980. This important event is held each year to promote awareness of energy problems facing our nation and, in particular, to stress the adverse impact of limited energy supplies and rapidly rising energy costs on naval force readiness. The event also informs military and civilian personnel on Navy and Marine Corps actions to achieve energy goals. Energy Awareness Week activities stress the need for all personnel to conserve energy.

This year's Energy Awareness Week theme, "Save Energy Today - Protect Our Tomorrow," draws attention to the critical importance of energy awareness and conservation. Saving energy today for use in the future is a challenge we must all face. Force readiness must be maintained and adequate living standards for today and tomorrow must be preserved. To do so requires total commitment to energy conservation. The Navy and Marine Corps have accepted these challenges and are vigorously pursuing programs to save energy. We have been leaders in energy programs but must now strive to advance our energy savings. We cannot maintain readiness unless we are successful in conserving energy.

The Navy Energy Office is providing this planning booklet and other informative materials to guide and support local command efforts to make our Energy Awareness Week. We urge commanders and commanding officers to actively participate in the planning and execution of Energy Awareness Week observances. Direct command involvement is key to effectively conveying the message that we must indeed save energy today if we are to protect our tomorrow.

ROBERT H. BARROW
General, U.S. Marine Corps

T. B. HAYWARD
Admiral, U.S. Navy

Appendix F

DEMONSTRATE HOUSING SUPPORT

- **Sample Newsletter Feature Note:**
  Family Housing Facilities and Energy Conservation
- **Sample Newsletter Feature Note:**
  Lighting in Housing Office
- **Sample Newsletter Feature Note:**
  Low-Intensity Energy Conservation Program

SAMPLE NEWSLETTER FEATURE NOTES

FAMILY HOUSING FACILITIES AND ENERGY CONSERVATION

Looking around you today you may question the wisdom of planners and decision makers when they designed, constructed, or purchased our housing, appliances, or other equipment. Although it may be hard to take their perspective, one should remember how different the requirements and constraints may have been ten, twenty, or thirty years ago. Our first "energy crisis" occurred less than ten years ago. Funding and design specifications may take several years to change. Production and acquisition may take additional years. On the other hand, deterioration over the life of a unit or piece of equipment can significantly alter its efficiency.

Living today we must accept what is and seek to improve it. The housing office tries to take advantage of every available opportunity to update, maintain, replace or otherwise improve the energy efficiency of family housing. Sometimes this occurs more slowly than we would like, especially where a particularly acute need exists. But remember the housing office is your advocate for energy conservation and efficiency.

LIGHTING IN THE HOUSING OFFICE

The housing office has just completed reducing the overhead lighting used in its offices, as well as eliminating lighting which was found to be unnecessary in an effort to conserve energy. Lighting is one small part of our energy consumption, but we believe in making "every kilowatt count".

LOW-INTENSITY ENERGY CONSERVATION PROGRAM

The energy conservation coordinator has not forgotten you. You may have noticed that although you're still getting regular consumption feedback, the coordinator's visits are becoming less frequent and that you are receiving less literature.

As we come to the peak of the (heating/cooling) season we feel we've delivered our message on conservation and trust that residents share our concern and will maintain their "energy-consciousness" and conservation-oriented practices. We'll still remind you to conserve once in a while and pass along new information that we think you'd find useful. Meanwhile we're working on a program for next (Summer/Winter) in order to help you make the most of your (cooling/heating) energy. We'll be keeping in touch with you.

APPENDIX G

INVOLVE THE ENTIRE FAMILY

- Ideas and Procedures for Activities
- Sample Newsletter Announcement: Speaker Series
- Sample Materials: Games
- Sample Materials: Contests
- Sample Materials: Field Trips

IDEAS AND PROCEDURES FOR ACTIVITIES

Guest Speakers

Guest speakers or a speaker/demonstration series may be used to supplement the energy conservation coordinator's information, while adding an interesting and credible component to the conservation program. The local utility company is probably the best source of speakers, with most companies having personnel whose primary responsibilities include such activities. In addition, utility companies often have literature and other materials, such as films, that can be presented to residents who attend the meetings.

In preparation for speaker activities several factors need to be considered, including selecting an appropriate location, obtaining necessary equipment (e.g., film projector), providing for child care, and informing and motivating residents to attend. If possible, a location near or within the housing facility should be selected, eliminating the necessity of driving to an unfamiliar location. If a longer drive is necessary, carpools can be formed among participating residents with the added benefit of increasing group solidarity. Although child care problems could inhibit program attendance, most difficulties can be solved by having simultaneous programs for children and adults. Since this, of course, would require at least two meeting locations, a local school, having classrooms and media equipment available, may serve as a location of choice. To increase the likelihood of participation, the conservation coordinator should select dates and times most conducive to residents' attendance and seek each resident's personal commitment to attend. Residents may be willing to bring simple refreshments, such as coffee and punch, for those persons attending.

Group Discussions

Group discussions can provide residents with an opportunity to discuss their conservation successes and failures and learn how other families deal with the energy situation. Discussions can assist residents in thinking of themselves as a team, supporting each member's conservation actions. A guest expert can serve as moderator to facilitate the discussion. Participants should be offered a chance to react to the speaker's ideas, providing examples and suggestions from their own personal experience. With the focus on the facilitator, residents often feel more comfortable within the discussion setting. Factors to consider in preparation for discussion groups are similar to those for guest speakers.

Small discussion groups can be organized by residents with encouragement by the coordinator. Residents with whom the coordinator has the best rapport can be asked to invite some of their friends over for coffee and a discussion. This arrangement would insure attendance and provide for a comfortable setting.

Conservation Games

One possibility for involving young children in the energy conservation effort is the "Energy Detective Program." In this program, children are given an energy detective kit, consisting of a detective case log listing conservation-oriented practices and supplementary materials providing conservation information. Prompts, such as energy conservation posters and buttons, and information sources, such as conservation coloring books and comic books, may be given as sources of information, reminders to conserve, and rewards for completion of the program. As "energy detectives," children monitor family energy conservation practices for one week, recording observations on detective case log sheets. Such monitoring helps children become aware of energy conservation and

appropriate energy conserving practices. Young children require parental assistance in understanding the concepts and procedures. As a result, the program is effective in involving the entire family, the young children through their observations, and the rest of the family through their explanations of the concepts and their coaching of children's activities. On completion of the log, parents certify that their child has performed the necessary observations. Children who complete the energy detective case log are given some reward, such as conservation posters or slogan stickers.

Factors to consider in conducting the energy detective program include explaining the program to residents and motivating children to participate. The energy conservation coordinator should explain the program's materials, objectives and incentives to residents with young children. Materials, such as energy-related coloring books, can be given to children potentially interested in the program. These materials, as well as positive parental influence, can increase the likelihood of participation.

Poster Contests

An energy conservation poster contest, with the theme "Energy Conservation Around the Home," is one possible way of involving young residents in the conservation efforts. Participating children make a poster concerning household energy conservation. The contest serves to increase childrens' awareness of energy conservation and appropriate conservation practices, leading to subsequent changes in their energy consumption behaviors. A public exhibition should be held, with each participant receiving a certificate. Judges could evaluate the posters, generously giving ribbons to children in accordance with their age and the quality of their poster.

Factors to consider in conducting a poster contest include motivating children to participte, materials necessary for poster design, an appropriate location for exhibition, and obtaining awards for participants. Initial announcement of the contest can appear in the newsletter. During resident contacts, the coordinator can generate additional interest and support by asking parents to urge their children to participate. Some residents may be willing to have poster parties, where neighborhood children can get together to share materials and ideas. Literature, such as conservation-related comic books, can be provided to participants to increase their interest in participating and their knowledge of appropriate conservation practices. Since material cost may pose an inhibiting factor, the energy conservation coordinator should provide examples of inexpensive, easy to obtain materials that can be used. A location within or near the housing facility would be best for the poster exhibition. Potential locations include public and military buildings, such as banks, the commissary, a theater, library, or even the housing office. Awards, such as certificates and ribbons, can be provided to participants. Ribbons of various colors can be obtained at a minimal cost. It is important that every participant receive positive recognition of their efforts. An awards ceremony can be conducted, with a significant public or military figure presenting the awards. Local newspapers, both public and military, may be asked to cover the ceremony.

Field Trips

The relationship between one's energy consumption and the necessity for energy production is an important concept for children to understand. An understanding of this relationship would likely promote better energy-related practices, as well as being a valuable educational experience.

Factors to consider in organizing a field trip include motivating residents to participate, possible need for parental supervision, and transportation to and from the site. Parents must be interested in the trip if they are to motivate their children to participate. An initial announcement can

appear in the conservation newsletter. The coordinator should, during subsequent resident contacts, discuss the objectives and values of the trip. Residents can be asked for support in getting their children to attend. Parents can also be asked to assist with supervision and transportation, eliminating problems of bus arrangements.

SAMPLE NEWSLETTER ANNOUNCEMENT: SPEAKER SERIES

CORRY SPECIAL EVENTS

ADULTS. Corry is to have a special series of presentations by Gulf Power to help us see where we fit in the energy picture and what we can do about it right where we live. Programs will include question and answer time.

This will be an opportunity for us to clarify our understanding of the energy situation and why Department of Energy Secretary James Schlesinger recently made his dramatic comments about the energy situation in the U.S. and its implications for the future. Since the problem is not going to go away, let's learn what we can do about it.

CHILDREN. Gulf Power will also present a program for children from Corry to raise their awaremess about energy conservation and get them started in developing energy conscious habits. This program will be split by grade level. (See schedule below.) Bus transportation will be provided, with pick-up and drop-off at each child's driveway. The bus will also be available for pick-up at Risher Ct. and at the corners of Pless and Smith, Magda and Smith, Crosby and Smith, and Crosby and Magda.

Children will enjoy these informative programs and will receive age-appropriate hand-outs to help them follow up on what they learn. These programs can help your children see how and why they can participate in their family's conservation efforts.

SCHEDULE OF EVENTS FOR SECOND PERIOD

Thur Aug 23rd Gulf Power Children's Program: "Being Energy-Wise"
Theater (Bldg 1504), NAS (corner of Hase & Slemmer)
1pm--Kindergarten through 3rd grades
2pm--4th through 6th grades
3pm--7th through 12th grades
Bus pick-up 1/2 hour before each program; drop-off 1/2 hour after.

Tues Aug 28th 7:30 pm Gulf Power Series: "The Energy Crunch--How We Can Cope".
Gulf Home Services Building, 75 N. Pace

SAMPLE MATERIALS: GAMES

INSTRUCTIONS TO PARENTS

The energy detective program has been designed to be a relatively simple approach to increasing your child's awareness of energy conservation and the concept of energy in general. Besides being a tremendous learning experience, your child will also have a great deal of fun, both in looking for "energy thieves," and in using the materials and rewards to be given. To make this program a real success we need your support and that of every family member. Although the program has been designed for children, some of the concepts will be difficult for young children to understand. With a little patience you can explain these more difficult concepts to your child, the end result being a fun learning experience.

SAMPLE PARENTAL CERTIFICATION FORM

PARENTAL CERTIFICATION--ENERGY DETECTIVE LOG

_____ has been an excellent Energy Detective and has diligently observed the ways that we can prevent possible robberies of energy from our home.

_____ _____

Date Parent's Signature

Energy Detective Case Log

Mon	Tue	Wed	Thu	Fri	Sat	Sun

TOTAL CHECKS

Front and back doors are closed quickly when the air conditioner is on.

Windows are closed when the air conditioner is on.

Drapes and blinds are closed during the hot hours of the day.

Family members take short showers rather than baths.

Lights are turned off when not needed.

TV and radio are turned off when no one is watching or listening.

Dishwasher is only used for full loads.

Dishes are dried without heat.

Refrigerator door is only opened briefly, when necessary.

Washing machine is used for full loads only.

Covers are used on pans during cooking.

The oven is turned off immediately after use.

INSTRUCTIONS

Be on the lookout for robberies of energy from your home. Each day check when you see the following things being done to prevent possible energy robberies. At the end of the week count the checks and compare with the list below to see how energy safe your home is.

84-68 = Hurray! Your family members are really WATT WATCHERS, and your home is an energy-safe place to live.

67-51 = Congratulations! Your family members are WATT SAVERS, but there may be some small-time energy thieves operating in your home.

50-34 = BEWARE! Your home may be the target of LARGE ENERGY HEISTS. Warn everyone to make every kilowatt count.

33-0 = CALL FOR HELP! You have an energy theft ring operating in your home.

SAMPLE DETECTIVE CASE LOG SHEET
(Actual Size: 8½" x 14")

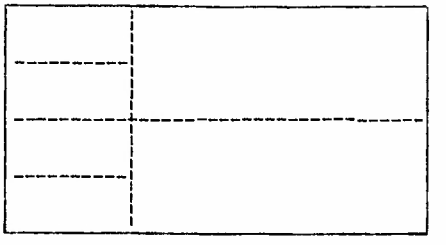
SAMPLE SLOGAN STICKERS

(Actual copies were printed on 8½" x 14" fluorescent removable bumper sticker paper)

SAMPLE SLOGAN STICKER INSTRUCTIONS

CONSERVATION STICKER INSTRUCTIONS

1. Cut between stickers with scissors as shown by dotted lines below:



2. Peel off backing paper. (May also be taped on with clear tape.)

3. Stick on your notebook, bicycle, car bumper, or other places APPROVED BY YOUR PARENTS.

SAMPLE NEWSLETTER ANNOUNCEMENT

Detective Program

By now our young detectives are actively observing their household for energy thieves. If they see any thieves, they should be "turned in" to headquarters (parents) immediately. By the end of the week your utility use may be improved, and everyone should be aware that their behavior can make a difference in household consumption. The watt you save may be your own (to use in the future).

All the energy detectives who completed their log sheets are eligible for 6 self-sticking, fluorescent-colored energy slogans. Just hand in the parent's certification slip to me next time I pass by.

SAMPLE MATERIALS: CONTESTS

SAMPLE NEWSLETTER CONTEST ANNOUNCEMENT

CORRY SPECIAL EVENTS

ENERGY CONSERVATION POSTER CONTEST. It's time to let the young people direct some of their own energy toward a little creative expression! Get out the paper, scissors, glue, marking pens, and anything else that seems appropriate, because we're having a poster contest. The theme of the contest is "Energy Conservation in the Home." The rules are simple:

1. Anyone 18 years of age and younger is eligible to participate.
2. Posters must be at least 8 x 10 inches.
3. Artist's name, age, and quarters number must be printed on the lower right corner (front).
4. Posters must be turned in to the NAS Pensacola Housing Office or to Janice McNair by 4p.m. on September 10th.
5. A maximum of 3 entries per person is allowed.

Posters will be judged on originality, appropriateness and style. Ribbons will be given for 1st through 5th places and honorable mention in each age division. There will be an exhibition of all posters and an awards ceremony. Time, dates, and location of the exhibition and awards ceremony will be forthcoming. Let's see how we can use our energy to save energy!

SAMPLE MAILED CONTEST ANNOUNCEMENT

****

Poster Contest

****

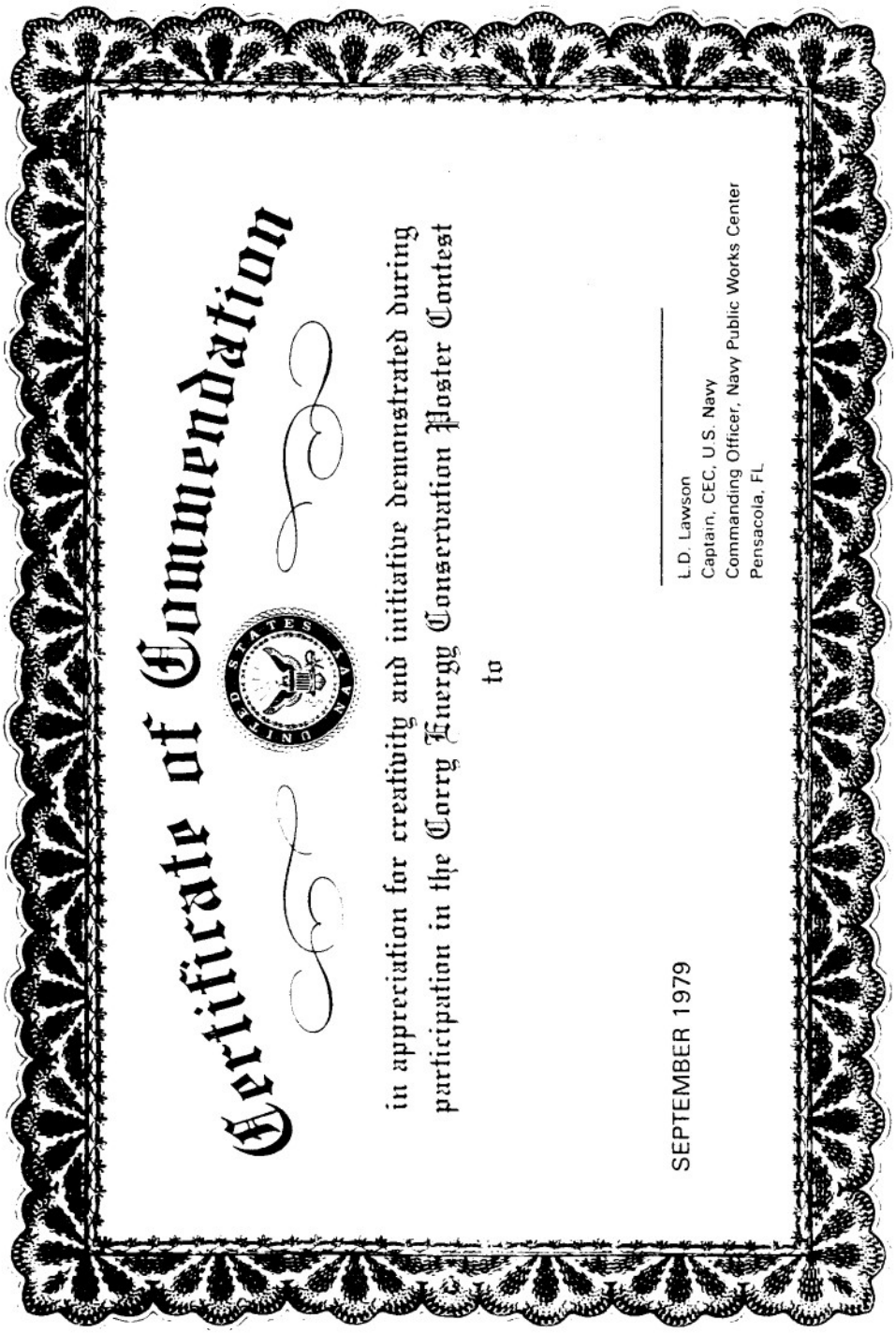
I hope that all of the young people are busy putting some of their creative talents to work, and are developing their contributions to the Corry Housing Energy Conservation Poster Contest.

Remember, the theme of the contest is "Energy Conservation in the Home", and the deadline for turning in the entries is 4pm on Monday, September 10.

We are planning a poster exhibition with an awards ceremony, and all contestants will receive a ribbon and certificate for their efforts. So, let's get the young people to spend a little time and energy on their posters right now.

SAMPLE CONTEST CERTIFICATE

(Actual copies were printed on 8½" x 11" yellow parchment paper.)



SAMPLE MATERIALS: FIELD TRIPS
SAMPLE FIELD TRIP ANNOUNCEMENT

August 15, 1979

STEAM PLANT TOUR

Greetings one and all,

Do you want to see where electricity is generated? Well here's your opportunity to do so at no cost to yourself. A group from Corry Housing, if enough people are interested, is going to tour Gulf Power's steam plant on August 22nd. We should be leaving at 12:15 in the afternoon, and be gone for approximately three hours. I hope everyone twelve and older will want to go. It should be quite enjoyable. Parents are more than welcome too.

If interested, call the Housing Office at 452-4412, and ask for Janice McNair. If I am not in when you call, please leave your name and telephone number so that I can get back to you. Please call this week, as arrangements must be made for transportation.

APPENDIX H

DEVELOP & MAINTAIN PROCONSERVATION ATTITUDES

- Family Contributions to Solving the "Energy Crisis"
- Health and Comfort vs. Energy Conservation
- Energy Conservation: Sacrifice?

FAMILY CONTRIBUTIONS TO SOLVING THE "ENERGY CRISIS"

One attitude fundamental to energy conservation practice is the belief that there is an actual energy problem or "crisis". Arguments against such a position include the belief that the crisis is an artificial result of excessive government regulations and/or the business practices of energy-related industries. An additional argument may consist of the belief that although there is an energy crisis, science and technology will find a solution. Whatever the argument used, the key pro-conservation points to emphasize are the reality of energy shortages in the mid- and long-term and the weakening of our country resulting from such limitations of available energy.

The residential sector accounts for approximately 20 percent of the total U.S. energy usage. In some cases it has been found that up to 30% reductions in utility consumption have been possible through voluntary effort. In addition, it is probably the most important training ground for the next generation of energy users. Energy awareness is an important attitude which can be acquired early in life and elaborated with maturation. It is especially important, because our energy savings can not all be "passive" (resulting from structural or technological changes). Much of the "savings" from new technology depends on individual user behavior. So the individual resident is doubly important for the immediate savings he/she can achieve, and for the future savings through new attitudes and practices extended from the residential situation to other spheres. The energy coordinator should impress upon military housing residents that families can make a sizable contribution to reducing the effects of the energy crisis.

HEALTH AND COMFORT VS ENERGY CONSERVATION

The relationship between energy consumption and health and comfort is often distorted or based on misleading myths. With regard to climate control, residents often see their alternatives as being a healthful, comfortable household environment versus conservation of energy. For many people, sacrificing health and comfort is going too far. The fact is that a healthful environment often coincides with energy conserving practices. For instance, the desire to have a warm household temperature during cooler winter months may be contrary to healthful concerns. Although for certain individuals, such as the elderly, persons with circulatory problems, and people taking certain drugs, household temperatures below 65 degrees may be harmful, for the majority of us, cooler temperatures are actually beneficial. Research has shown that higher heating temperatures result in lower humidities, causing drying of lung tissues and an increase in bacteria carried with dust in the air. This condition enhances the likelihood of various respiratory ailments.

ENERGY CONSERVATION: SACRIFICE?

One researcher in the field of energy conservation labels energy saved through efficiency "conservation energy", since he believes that conservation is no less an energy source than oil, gas, coal or nuclear. This researcher goes on to state that:

> "conservation may well be the cheapest, safest, most productive energy alternative readily available in large amounts. By comparison, conservation is a quality energy source. It does not threaten to undermine the international monetary system, nor does it generate problems comparable to nuclear waste. Contrary to conventional wisdom, conservation can stimulate innovation, employment, and economic growth. Since the United States uses a third of all the oil used in the world every day, major reductions in U.S. demand would have a major impact on the international energy markets". (see reference below.)

It has been stated by authorities that "if the United States were to make a serious commitment to conservation, it might well consume 30 to 40 percent less energy than it now does and still enjoy the same or an even higher standard of living. That savings would not hinge on a major technology breakthrough, and would require only modest adjustments in the way people live". This last point should be conveyed to residents, since many feel that energy conservation entails sacrifices on their part, making them resistant to voluntarily reducing their energy consumption. In reality, no large sacrifice is necessary. For example, setting the thermostat lower may be easily compensated for by wearing a sweater. It should be stressed that only modest changes in behavior with regard to energy usage are needed to produce substantial savings. When they realize this, they will be more likely to participate in achieving conservation goals.

Yergin, Daniel. Conservation: The key energy source. Chapter 6 in R. Stobaugh and D. Yergin (Eds.) *Energy future: Report of the energy project at the Harvard Business School*. New York: Random House, 1979.

APPENDIX I

PROVIDE FEEDBACK ON USAGE

- Data Collection and Calculation Procedures
- Sample Monthly Notice
- Sample Newsletter Announcement

DATA COLLECTION AND CALCULATION PROCEDURES

Consumption Feedback and Evaluation

Residents in most cases will be interested in learning how much energy they consumed. However, a number is essentially meaningless by itself. It must be interpreted. This requires some comparison with a reference or standard. The nature of the standards available depend on the housing situation (particularly how it is metered). The methods of providing standards which are presented in this appendix are classified below according to the housing situation.

Calculation Method	Individual Meters	Master Meters	
		Single	Multiple
A. Comparison with Current Average Household Consumption	X		
B. Comparison with Past Consumption	X	X	X
C. Temperature Corrected Comparisons with Past Consumption	X	X	X
D. Current Average Household Cluster Consumption			X

Specificity of Consumption Feedback

Utility consumption data will be available on either an individual or group basis. When separate meters exist for each household it is preferable to inform residents of their individual consumption as opposed to that of the group. However, since military housing typically is master-metered and only total consumption of the group is measured, each residence must receive identical feedback. With either kind of metering, feedback notices can provide residents with comparisons of present and past consumption. However, comparisons of present consumption with that of others requires either individual metering or more than one master meter.

Form and Content of Feedback

Consumption information can be provided in individual feedback notices or "mock" bills or, in the master-metered case, a newsletter (see examples in this appendix). Both quantity and cost information (with comparisons) are important. The former allows checking accuracy of readings, and the latter converts the information into more understandable terms. Percentage changes are convenient, understandable summaries.

Calculation Procedures

Method A — Comparison with Current Average Consumption Individually metered household units allow comparisons of each unit's consumption with that of the average household. This method avoids the necessity of collecting data on past consumption or calculating temperature corrections. It is an easy procedure for residents to understand. All that is required is the calculation of an average for each utility and the comparison of that average with the consumption of each residence. The result may be similar to the example at the end of this appendix.

Interpretation of a resident's deviation from the average must take into account the size of the family and their home. The more persons living in a home and the greater the physical size of the home, the greater their expected utility usage. The energy required for heating and cooling is directly proportional to unit size (square footage). Although residents with large families may consume more than the average, they still may be energy conservers for their size of family. The program must avoid frustrating these residents and reducing their motivation to conserve. With adequate recognition and explanation of these factors all families should realize positive results for their efforts to conserve.

One additional note concerning individually-metered sites. Residents may be interested in reading their own meters to receive immediate feedback regarding their consumption. By reading their own meter, residents can conduct "experiments" to examine the relationship between their energy-related practices and utility consumption (see Appendix D).

Method B – Comparison with Past Consumption This method requires calculation of an average utility consumption figure for the same consumption period during the preceding two or three years. Utility consumption fluctuates as a result of temperature changes as well as other factors. The average baseline approach minimizes the influence of these chance variations in temperature from year to year and increases the reliability of the comparisons. The more years included in the average, the more stable the standard for comparison.

As an example of applying this method, consider a situation in which you are interested in comparing the utility consumption for February this year with consumption during previous years. To calculate the average the consumption figures for the preceding three Februaries must be summed and divided by three. The resulting number can be compared with the present consumption by using the following formula.

$$\frac{\text{Present February Consumption} - \text{Average Previous February Consumption}}{\text{Average Previous February Consumption}} \times 100 = \text{Percent Difference}$$

Energy consumption has been reduced if the percent difference is negative; it has increased if the difference is positive. Random fluctuations in consumption levels during the current year will account for some changes, but consistent decreases for several consumption periods can be interpreted as energy savings. Modest decreases in consumption can be viewed as energy reductions, while modest temporary increases can be explained in terms of weather fluctuations and other factors when appropriate.

Method C – Temperature Corrected Comparisons with Past Consumption Utility consumption levels are highly dependent on temperature fluctuations. A particularly warm or cool period would result in more extreme utility usage. On such occasions the simple averaging approach of Method B would be a poor estimate of utility consumption variations over time. Method C uses a correction factor for daily temperature variations. Temperature variations are measured according to "degree-day units." Although this method has limitations, such as failing to consider humidity or solar radiation, it greatly increases the overall accuracy of comparisons among consumption figures.

Calculation of temperature corrected utility consumption levels can be made under either individual or master metering. This approach requires an additional step in the calculation of energy savings. Using daily high and low temperature readings (in fahrenheit) an average daily temperature

must be calculated. The number of degree-day units for each day is determined by subtracting 65 (degrees fahrenheit). The total number of degree days during a particular consumption period is obtained by algebraically summing the number of degree-day units for all the days in that consumption period. The following example can help illustrate this computation:

	Day 1	Day 2	Day 3
Day's high temperature:	84°	82°	73°
Day's low temperature:	67°	75°	55°
Day's average Temperature:	75.5°	78.5°	64°
Day's degree-day units:	75.5° – 65° = 10.5	13.5°	– 1°

TOTAL for 3 day consumption period: 10.5 + 13.5 – 1 = 23 degree-day units

Total utility consumption divided by the total degree-day units yields a consumption figure which is corrected for temperature and can be compared with the average for the preceding years, likewise corrected for temperature. The following example illustrates this computation:

1. June 1981 electricity consumption: 800 Kwh
2. June 1981 correction for temperature: 173 degree-day units
3. June 1981 consumption: $\frac{\text{Electricity consumption}}{\text{Temperature correction}} = \frac{800}{173} = 4.62$ kwH/degree-day unit
4. June 1980 consumption: $\frac{750}{142} = 5.28$ Kwh/degree day unit
5. June 1979 consumption: $\frac{825}{179} = 4.61$ Kwh/degree day unit
6. June 1978 consumption: $\frac{765}{125} = 6.12$ Kwh/degree day unit
7. Average for June over preceding three years: $(5.28 + 4.61 + 6.12)/3 = 5.34$ Kwh/degree day unit
8. Computation of percent difference:

$$\frac{\text{June 1981 consumption} - \text{Average previous consumption}}{\text{Average previous consumption}} \times 100 =$$

$$= \frac{5.28 - 5.34}{5.34} \times 100 = -1\%$$

This result may be interpreted as one percent less electricity consumed this year compared to previous years.

Method D – Current Average Household Cluster Consumption Many master-metered housing sites have units clustered so as to have several master-meters. This metering approach allows comparisons of average consumption to be made among sites within the housing complex. Comparing the usage of two or more subgroups within the housing site during the same period avoids much of the problem of variations due to temperature. The comparisons are easier, because temperature corrections, as well as historical data, are unnecessary. However, considerations should be given to factors such as the relative average size (i.e., square footage) of the housing units at each site and the average number of persons in the households at each site. Sites with larger units and

more residents per unit can be expected to consume more energy. To some extent sites can be equated with respect to such matters by using simple correction factors. For example, sites with different sized units can be equated in that respect by deriving a correction factor from a ratio of their square footages.

One way to derive an overall correction factor for differences among housing sites is to determine their relative consumption during an extended historical period. Utility usage over the past six months or year can be tracked to determine if consistent consumption differences are present. If so, the ratio of consumption of the two sites can be used as a correction factor for equating their current consumption for comparison purposes.

All that is required for comparisons among sites within the housing complex is the average (corrected) household consumption per site. This is calculated by dividing the total consumption of each site by the number of occupied units at the site during the consumption period. The resulting figures are then comparable across sites.

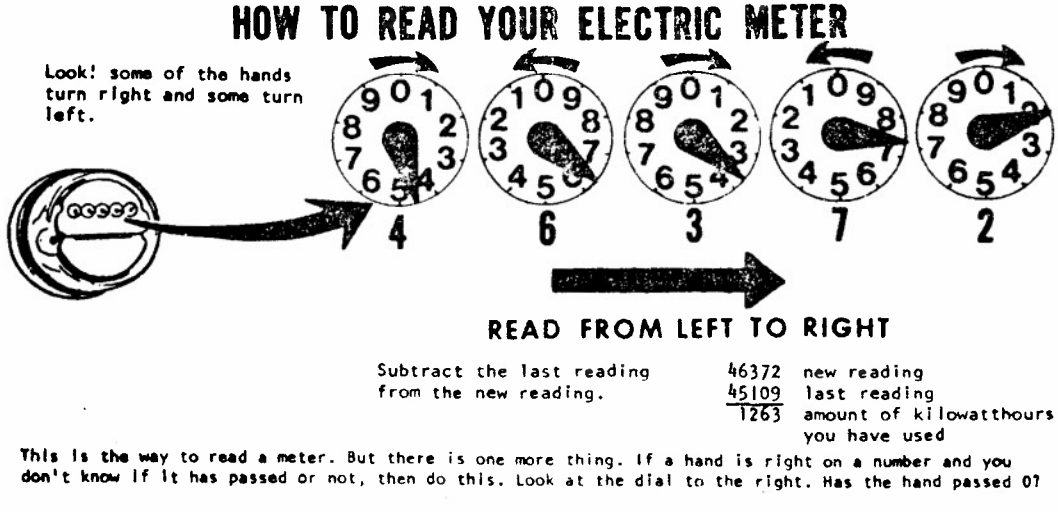
Collecting Data

For the calculation methods described above, several types of data may be necessary: (1) present utility consumption, (2) previous utility consumption, (3) daily high and low temperatures, (4) occupancy, (5) size of family, and (6) size of housing units.

Data on present utility consumption can be obtained by either directly reading utility meters at the beginning and end of each period or from utility company billings. The former has numerous advantages which make it preferable. Most important, the direct reading of meters enables minimum lag between actual consumption and feedback to the user; it also allows selection of the length of the consumption periods. Promptness in passing consumption information to residents is of utmost importance in developing their understanding of the link between energy-related practices and resulting consumption.

Meters are easy to read, but care is required to avoid errors. If necessary the local utility company can be contacted for assistance.

The figure below illustrates how to read a typical electric meter. Although meters come in various types, they all have simple dial or digital read outs.



Data on previous utility consumption can be obtained from housing office or utility company records. Similarily, temperature data can be obtained from several sources, including local military and civilian airports. When obtaining temperature data the location of the data center should be as close as possible to the housing units. Housing office records should provide occupancy and family size data. Plans for housing projects available in the housing office usually show square footage of the various units.

SAMPLE MONTHLY NOTICE

HOUSEHOLD UTILITY CONSUMPTION AND COST
PORT HUENEME FAMILY HOUSING

FEB 20 1981

T. R. SMITH
1000C GUAM DR.
PORT HUENEME, CA 93043

DEAR HOUSING RESIDENT:

YOUR ELECTRICITY AND GAS USAGE FOR FEBRUARY 1981 WAS $56.82. YOUR TOTAL ENERGY COST FOR FEBRUARY WAS $12.93 LESS THAN THE AVERAGE FAMILY ON BASE AT PORT HUENEME.

	ELECTRICITY (KWHR)	NATURAL GAS (THERMS)	TOTAL COST
METER READING			
FEBRUARY (02/13/81)	(0157)	(8364)	
JANUARY (01/12/81)	(9859)	(8286)	
FEBRUARY USAGE AND COST			
YOURS	$17.82 (198)	$39.00 (78)	$56.82
AVERAGE FAMILY	$24.75 (275)	$45.00 (90)	$69.75
YOURS COMPARED WITH THE AVERAGE FAMILY	$ 6.93 (77) 28% LESS	$ 6.00 (12) 13% LESS	$12.93 19% LESS

THIS MONTH'S ENERGY CONSERVATION TIP:

KEEP REFRIGERATOR AND FREEZER CONDENSER COILS CLEAN. IF ALLOWED TO ACCUMULATE DUST AND DIRT, HEAT TRANSFER WILL BE IMPAIRED AND MAKE IT MORE DIFFICULT FOR YOUR REFRIGERATOR TO MAINTAIN ITS THERMOSTAT SETTING.

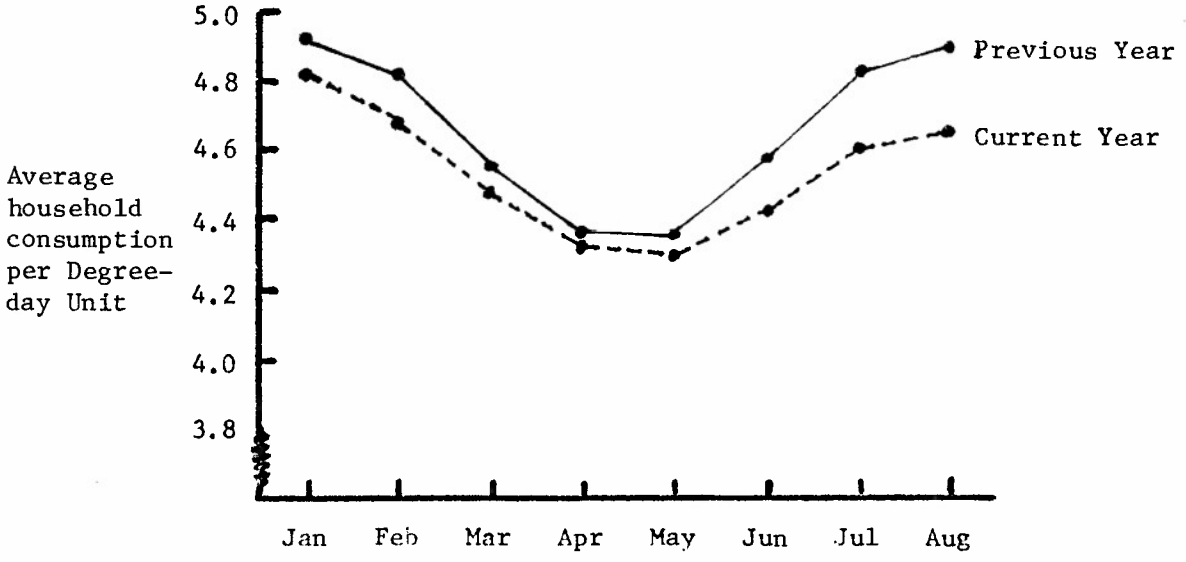
REMEMBER EVERY KILOWATT COUNTS!

THANKS FOR YOUR EFFORTS,
JOE CHESEBORO
ENERGY COORDINATOR

SAMPLE NEWSLETTER ANNOUNCEMENT OF CONSUMPTION

Energy Conservation Results

There's good news from the third two-week period of the energy conservation study (which preceded the hurricane)! Although the overall average utility consumption was slightly high, probably due to the weather, the difference between previous year and current year was the largest yet achieved (see graph below)



This notable improvement demonstrates that applying the energy conservation tips can make a difference, and the more of us who apply them the bigger the difference will be. Let's concentrate on helping our children become aware of how their actions can affect our energy consumption and what they can do to "save a fossil by conserving energy".

Our 10% goal is definitely within reach now, so keep up the good work!

APPENDIX J

COMMEND CONSERVATION EFFORTS

Master-metered Sites

- Single Site
- Multiple Sites

Individually-metered Sites

- Graded Individual Commendations for All Residents
- Recognition for Top Conservers
- Commendations for Top Conservers

Sample "Mock" Bill Highlighting Top Conserver

Sample Commendation Certificate

COMMEND CONSERVATION EFFORTS

Somewhat different procedures are possible for commendations in master-metered and individually metered housing sites. These are treated separately below.

Master-Metered Sites

Master-metered sites may be further sub-divided on the basis of whether all housing units are metered together (resulting in one meter) or several clusters of units (e.g. 8-unit row houses) are master-metered (resulting in several master-meters). Where only one meter exists the entire housing complex must be treated as a single site. Several master-meters allow subdivision of the housing complex into multiple sites.

Single Site In one sense this is the simplest case, but it is also the least potent in terms of power to reinforce specific conservation practices of particular individuals or families. All residents must be considered a team and their score is their overall consumption. This overall consumption may be compared with the immediate previous period or the same period of previous years with adjustments for temperature differences where possible (see Appendix I). This comparison will yield an indication of success or failure in energy conservation.

In this case the only parameter of the reinforcement process which can be varied is frequency. The more frequent the meter readings (the shorter the consumption periods), the more frequently commendations for success can be delivered. Used in conjunction with goal-setting (see Appendix D), residents can feel they have a target toward which they are progressing. Partial success can be the basis for encouraging continued, more extensive efforts by those who are actively participating. It can also indicate the need to recruit other uninvolved residents in order to gain their contribution to the overall goal. For instance, it might be pointed out that the 3% overall savings during the last consumption period might have been doubled or tripled if every family in the site were actively involved in practicing conservation measures. It should be borne in mind, however, that 100% participation is an unrealistic expectation even in the most intensive campaign.

The major strength of the single site master-meter situation is the potential for development of strong team spirit where participants exert peer pressure on non-participants to join the effort. This peer influence multiplies the efforts of the energy conservation coordinator in both number of persons contacted and the degree of power exerted. Often peer influence will reach persons the coordinator could not, and it may achieve greater success. The strategy of the coordinator should be to capitalize on these forces and foster them. This might best be done by commending active participants for their efforts to reach others as well as for their efforts at home. The commendations should also emphasize the value and importance of the goal and build a sense of accomplishment among the residents as they move toward it.

Multiple Sites This case adds an extremely important factor to the single site case, namely, group competition. Since comparisons of the average consumption per household in each site can be made (see Appendix I) and reported back to the residents, the conservation goal need no longer be the only reference for judgement of performance. Given other groups whose performance is known, the natural tendency is to judge one's own performance relative to that of others. The performance of others can be valuable in demonstrating the practical feasibility of achieving a certain level of conservation. Competition increases motivation to achieve, and it may be used to build group feeling and mutual support in conservation efforts. This may become apparent in exchange of ideas for solving problems (e.g., how to gain the cooperation of children), in exchange of information, or in mutual encouragement.

Again, these factors can be valuable complements to the efforts of the energy conservation coordinator. To the extent that they become operative, these forces can result in a program "taking off" or beginning to be self-generating. The coordinator can then take a facilitative role, providing consumption feedback, conservation tips and information, encouragement, and more commendations.

The energy conservation coordinator should maintain impartiality in dispensing praise and encouragement to competing groups. Even when one group is performing at a considerably lower level than another (e.g., 5% vs 15%) their accomplishment should be recognized and helpful suggestions for improving their performance made. The coordinator should beware of possible development of an apathetic or demoralized attitude on the part of the group that is "behind". This situation should be taken as an opportunity to develop greater understanding of the large number of factors (e.g., participation rate, differential insulation, etc.) and practices/techniques (e.g., thermostat setting, games for gaining involvement of children) which contribute to overall consumption. Furthermore, the coordinator should not overemphasize differences in performance in a single consumption period. Since a number of random (e.g., occupancy rates) and uncontrolled factors (e.g., breakdown of air conditioning, travel, etc.) can temporarily influence average consumption, it is much safer to interpret trends over several consumption periods.

Individually Metered Sites

Although this situation is relatively rare in Navy family housing, where it does exist it substantially increases the potency of the coordinator's reinforcing power. Each family's consumption can be compared in a number of ways with present or past consumption (see Appendix I), and these comparisons can be used to make different points (e.g., consumption relative to others, conservation relative to past usage, etc.). In addition, the linkage between results (both feedback and reinforcement) and whatever behaviors or practices produced them is extremely important in creating and maintaining new habits. Since the goal of the conservation program is to change residents' behaviors to more conservation-oriented practices, the coordinator should strive to make his reinforcements of conservation behaviors closely linked to performance outcomes (e.g., savings or reductions). Reinforcements should be as frequent as possible (requiring as short consumption periods as practically feasible) and as soon after the time of consumption as possible. The great advantage of individual metering is the capability of providing feedback and reinforcement to each and every resident family. In some cases special recognition may be desired for those families whose performance is outstanding. Three alternatives are discussed below.

Graded Individual Commendations for All Residents Though all residents receive feedback, not all should receive the same reward. A graded series of commendation possibilities may be developed, where the nature of the commendation depends upon the degree of conservation (or lack of it) demonstrated. The following is an example:

Change in Consumption	Commendation
– 11% or more	Strong commendation
– 3.1% – 10%	Praise & encouragement
± 3%	Query (Are you participating? Do you need help?)/Urging/ Encouragement
+ 3.1% – 10%	Query (What went wrong?)/Urging
+ 11% or more	Strong appeal

In other words, this model suggests five kinds of responses to residents' energy consumption, depending on the level of their performance. These could be programmed into a computer which prepares "mock" utility consumption bills and the appropriate response chosen and added to the mock bill. In non-automated situations, a mass production approach could be used by developing the five commendations into standard memos which could be included with consumption feedback as appropriate.

Recognition for Top Conservers In addition to the graded individual commendations, it is often desirable to highlight those whose performance is outstanding. One means for doing this is to develop a list of the highest performers in a particular consumption period and publish this list in the newsletter or on the bottom of the "mock" utility bills. An example of the latter is shown in this appendix.

Commendations for Top Conservers Top conservers over an extended period of time (e.g., one month or one season) might be given special recognition in a number of forms, such as a certificate of commendation (see example in this appendix); a small feature article based on interviews of these families printed in the base newspaper, possibly with individual or group portrait; recognition at a ceremony, luncheon/dinner, energy fair, or other special event; assignment to a special status, such as family housing energy conservation consultant to the commanding officer or advisor for the energy conservation fair or consultant for Energy Awareness Week.

SAMPLE "MOCK" BILL HIGHLIGHTING TOP CONSERVERS

HOUSEHOLD UTILITY CONSUMPTION AND COST

March 3, 1981

T. R. Smith Family
1000C Guam Dr.
Port Hueneme, CA 93043

Your electricity and gas usage for February 1981 was $56.82. Your total energy cost for February was $12.93 less than the average family on base at Port Hueneme. The details are shown in the table below.

	Electricity (KWHR)		Natural Gas (Therms)		Total Cost
Meter Readings					
February (02/28/81)	(0157)		(8364)		
January (01/30/81)	(9859)		(8286)		
Usage & Cost for FEBRUARY					
Yours	$17.82	(198)	$39.00	(78)	$56.82
Average family	$24.75	(275)	$45.00	(90)	$69.75
Yours compared to Average family	$ 6.93 LESS	(77)	$ 6.00 LESS	(12)	$12.93 LESS

TOP CONSERVERS FOR FEBRUARY

Congratulations to:

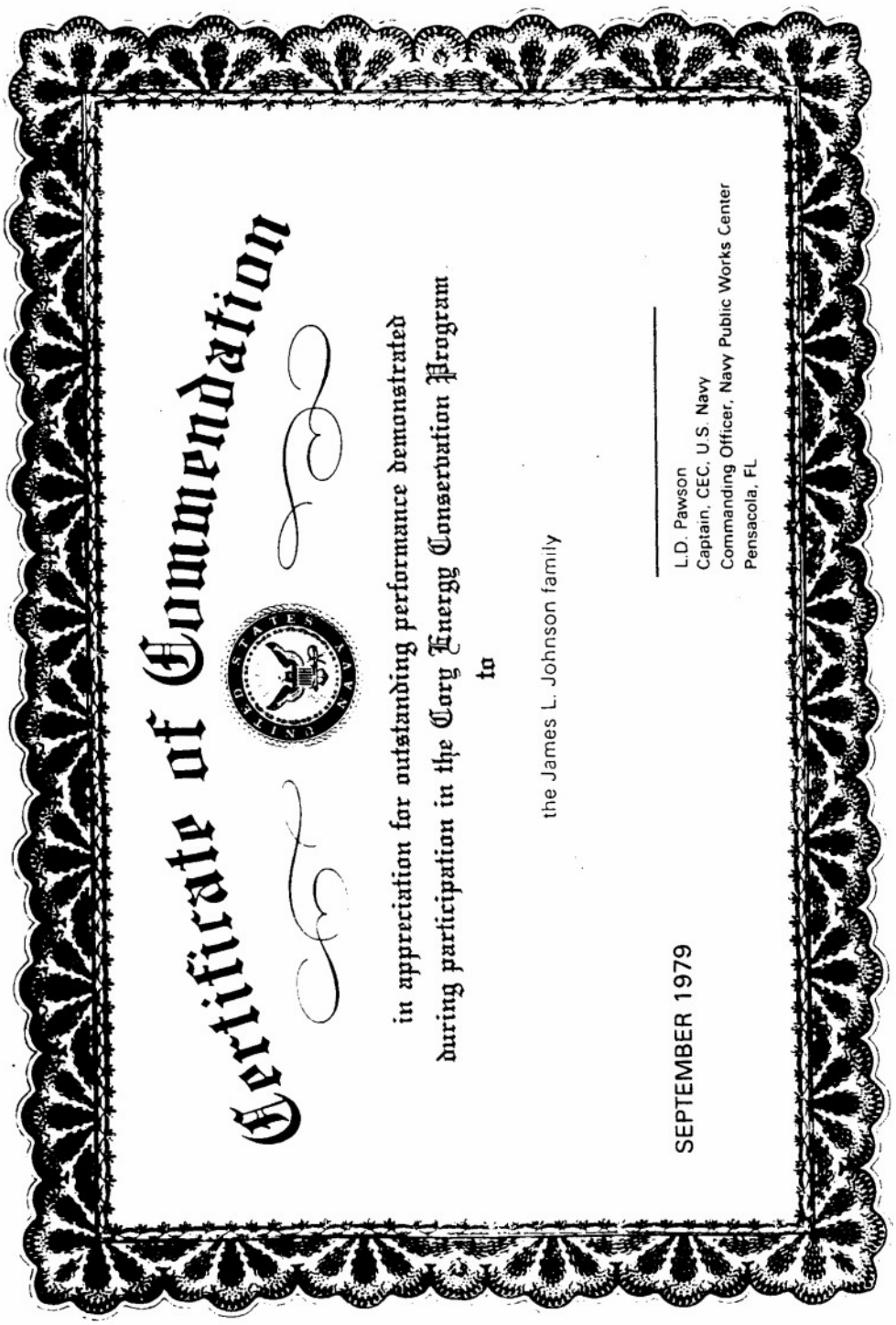
CWO3 Williard Townsend and Family (25 percent less)

LT. JG David Garner and Family (23 percent less)

CAPT. William Kekafer and Family (23 percent less)

Keep up your outstanding work!

SAMPLE COMMENDATION CERTIFICATE



Certificate of Commendation

in appreciation for outstanding performance demonstrated
during participation in the Cory Energy Conservation Program
to

the James L. Johnson family

SEPTEMBER 1979

L.D. Pawson
Captain, CEC, U.S. Navy
Commanding Officer, Navy Public Works Center
Pensacola, FL

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